Southern Power & Industry

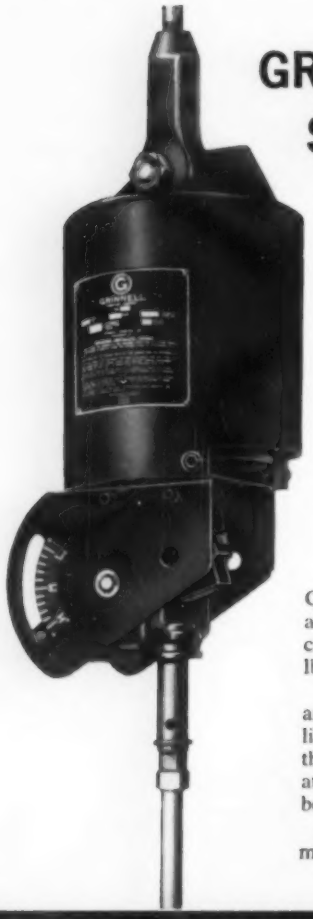
The Industrial and Power Journal of the South and Southwest

SEPTEMBER, 1959

PHOTOGRAPHY

An Industrial Training Tool - - - P. 34

GRINNELL CONSTANT SUPPORTS...



2 BASIC DESIGNS...
11 DIFFERENT METHODS OF ATTACHMENT

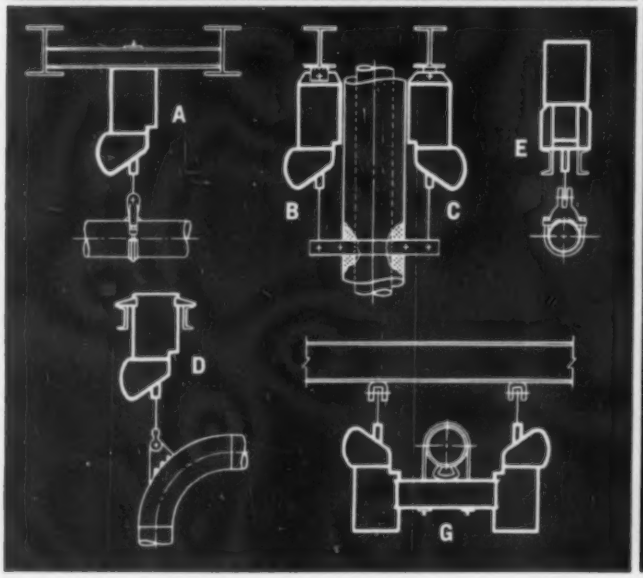
Grinnell Constant Supports are available in a range of sizes to provide capacities for loads from 27 lbs. to 57,500 lbs., with travels up to 16 inches.

Both vertical and horizontal hangers are designed to operate in extremely limited space. In the selection of types, there is a choice of 11 methods of attachment to structures—either above, between, or below supporting steel.

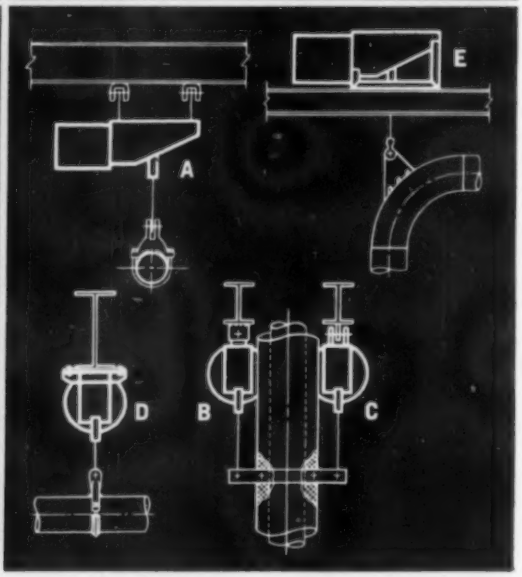
Grinnell Constant Supports provide mathematically perfect load support throughout all positions of travel . . . also a full 70 percentage points of adjustability is built into them. No less than 10% of this adjustability is allowed either side of calibration for plus or minus change in load. Field readjustments are easily made by turning a single load adjustment bolt.

Call on Grinnell's Pipe Suspension Department for help with your pipe suspension problems. Grinnell Company, Providence 1, Rhode Island.

FOR VERTICAL ATTACHMENT



FOR HORIZONTAL ATTACHMENT



GRINNELL

AMERICA'S No. 1 SUPPLIER OF PIPE HANGERS AND SUPPORTS

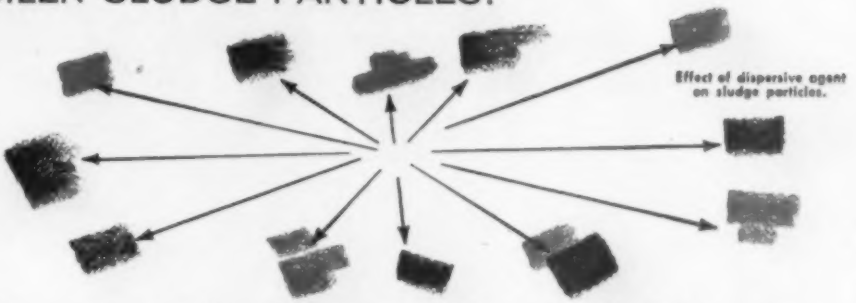
SOUTHERN POWER & INDUSTRY is published monthly by W. R. C. Smith Publishing Co., Executive and Editorial Offices: 806 Peachtree St., N.E., Atlanta 8, Ga. Second-class postage paid at Charlotte, N. C. Subscription Rates: United States and Possessions, $1.50 per year or two years for $3.00; Foreign Countries, $10.00 per year.

Volume 77 Number 9

ALLIS-CHALMERS

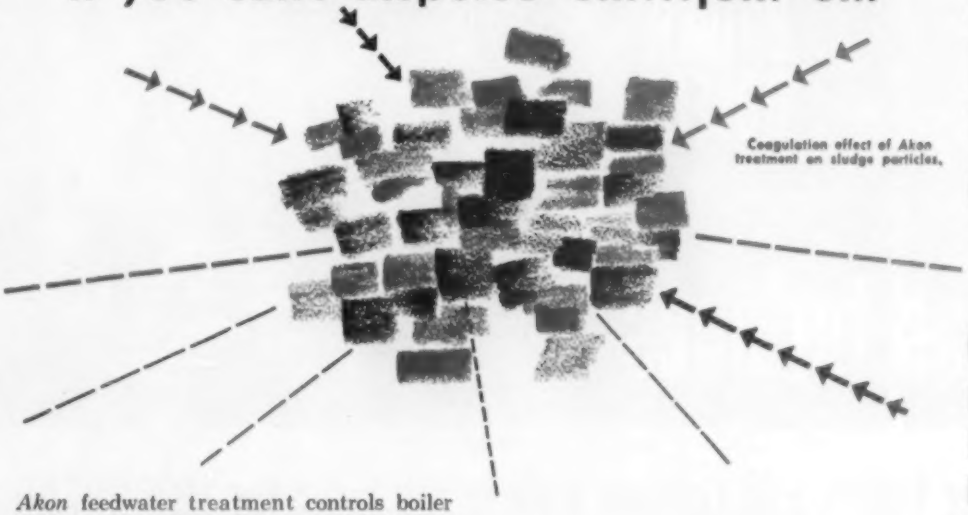
In pace with POWER... ALLIS-CHALMERS

BOILER SLUDGE PARTICLES:



Effect of dispersive agent on sludge particles.

If you can't disperse 'em...join 'em



Coagulation effect of Akon treatment on sludge particles.

Akon feedwater treatment controls boiler sludges where dispersive agents fail or lose their original effectiveness.

Coagulating action of *Akon* treatment takes sludge particles out of circulation by forming fluffy, *nonadherent* flocs. These flocs are readily discharged with less blowdown than otherwise required — save fuel, water and chemicals.

More advantages of this process: Eliminates dissolved oxygen by scavenging action to prevent corrosion; permits operation at lower alkalinities; reduces tendency for carryover with no decomposition products.

To cut your boiler operating costs and protect your equipment investment now and for years to come, specify Allis-Chalmers feedwater treatment.

Akon is an Allis-Chalmers trademark.

Bulletin 2887408 illustrates and describes *Akon* treatment. Bulletin 28X7731 provides correct procedures for boiler cycle blowdown.

Mail coupon below for helpful facts on *Akon* treatment and blowdown —

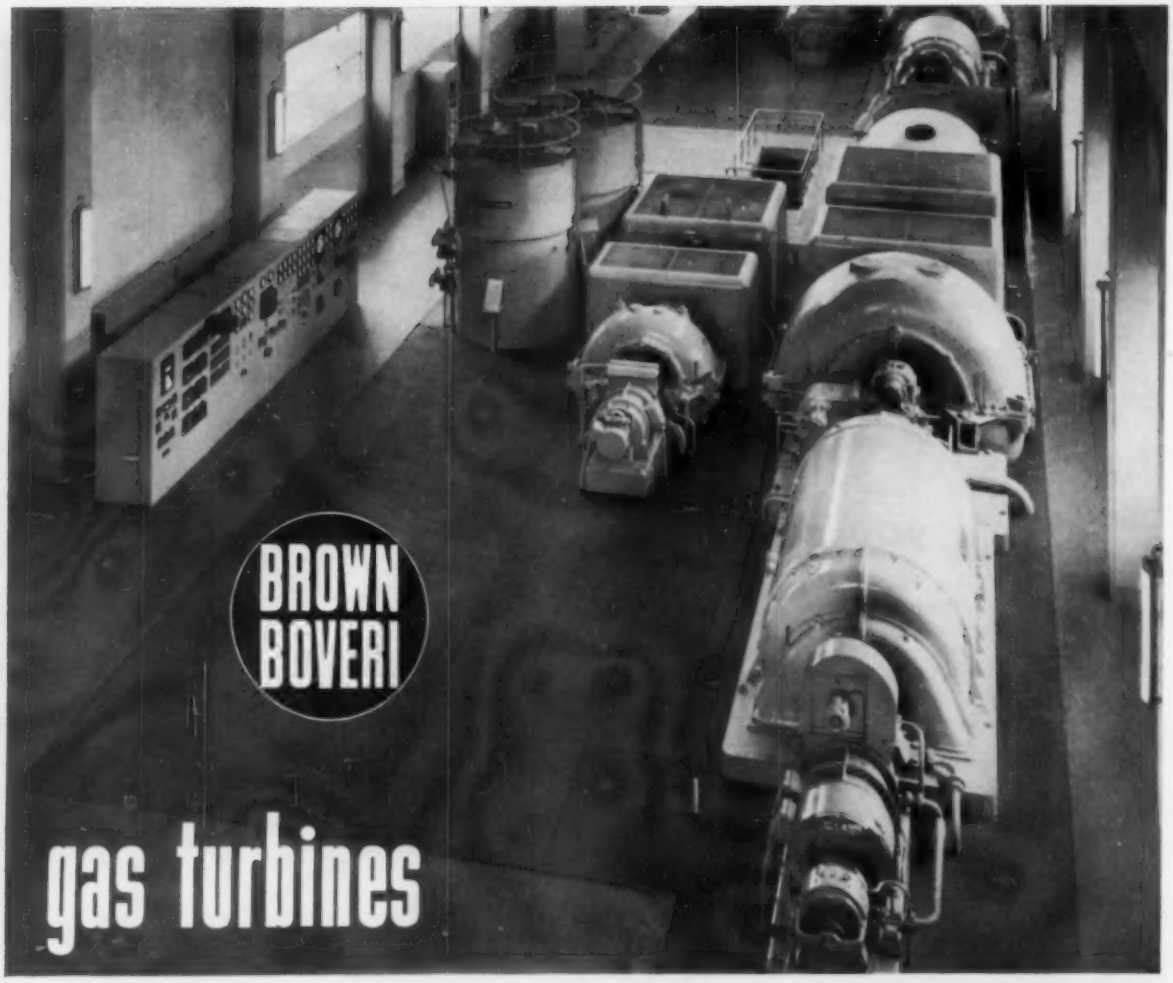
ALLIS-CHALMERS
Milwaukee 1, Wisconsin
Gentlemen:
Please send me the bulletins I have checked below:
☐ 2887408 on Akon treatment
☐ 28X7731 on Blowdown

Name.....
Title.....
Company.....
Address.....
City.....
Zone..... State.....

A-1153

A-C ALLIS-CHALMERS
WATER CONDITIONING
✓ EQUIPMENT ✓ CHEMICALS ✓ SERVICE

ALLIS-CHALMERS



our 100th gas turbine now being built for MOORHEAD, MINN.

OVER 1,300,000 KW in total gas turbine capacity built or on order for industrial and utility applications, including 16 units in the United States, Puerto Rico and Canada with a maximum capacity of over 300,000 KW . . . *experience unmatched by any other manufacturer.*

PROVEN DEPENDABILITY AND ECONOMY of Brown Boveri gas turbines has been established in many years of operation in installations the world around, often under extremely adverse conditions.

STANDBY AND PEAKING POWER — The 7,400 KW Brown Boveri gas turbine (with a bonus wintertime capacity of up to 10,000 KW) purchased by the Moorhead municipal utility is tailormade for the city's peaking and standby requirements. Brown Boveri gas turbines offer many unique and proven advantages in this type of application.

POWER FACTOR CORRECTION using the generator as a synchronous condenser. A specially-developed coupling, exclusive with Brown Boveri, makes it possible to disconnect the generator from the turbine and reconnect it again at full speed whenever power generation is needed.

BASE LOAD OPERATION — Backed by a long record of engineering and production firsts, Brown Boveri gas turbines have been an unqualified success in many base load applications. And on the engineering horizon is the use of gas turbines in combination with steam cycles for even more efficient base load performance.

BROWN BOVERI CORPORATION

19 Rector Street, New York 6, N. Y.

Atlanta • Birmingham • Boston • Buffalo • Charlotte • Chicago • Cleveland • Dallas • Denver • Detroit • Hamilton, Ohio • Jacksonville
Kansas City • Knoxville • Miami • New Orleans • New York • Pasadena • Pittsburgh • Portland • Roanoke • San Francisco
San Juan • Syracuse • Tucson

BPA
NBP

Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

Eugene W. O'Brien
Managing Director

Francis C. Smith, Editor

Milton C. May . . . . . Field Editor
P. O. Box 11015, Charlotte, N. C.

John F. Lee . . . . . Consultant on Atomics
North Carolina State College, Raleigh, N. C.

Baron Creager . . . . . Southwestern Editor
6131 Luther Lane, Suite 208, Dallas 25, Texas

J. P. Warren . . . . . Editorial Consultant
1430 West 6th Street, Freeport, Texas

C. B. Washburn . . . . . Editorial Assistant

J. A. Moody . . . . . Production Mgr.

H. Redfern Hollins . . . . . Promotion Mgr.

Richard L. Priess . . . . . Advertising Mgr.

BUSINESS REPRESENTATIVES

BOSTON: J. Doug Parsons, 39 Atlantic Ave., Cohasset, Mass. Tel. Evergreen 3-0712.

CHARLOTTE: W. Cliff Rutland, Box 102, Gastonia, N. C. Tel. UNiversity 7-7995.

CHICAGO: Hugh Aull, 333 N. Michigan Ave., Chicago 1, Ill. Tel. CEntral 6-6964.

CLEVELAND: Joseph B. Rogers, 16404 Southland Ave., Cleveland 11, Ohio. Tel. CLearwater 1-9063.

DALLAS: Baron Creager, 6131 Luther Lane, Suite 208, Dallas 25, Texas. Tel. EMerson 1-6521.

LOS ANGELES: Warren R. Christian, 4140 Edenhurst Ave., Los Angeles 39, Calif. Tel. Hollywood 2-1133.

NEW YORK: William L. Rogers, Room 610, 7 East 42nd St., New York 17, N. Y. Tel. Murray Hill 2-4959.

PHILADELPHIA: James R. Corgee, 27 East Windermere Terr., Landsdowne, Pa. Tel. MAdison 6-9145.

SAN FRANCISCO: Fred Jameson, 821 Edinburgh St., San Mateo, Calif. Tel. Diamond 3-8806.

Subscription Rate: 1 Year — $1.50
2 Years — $3.00; Foreign — $10.00

Published monthly by
W. R. C. SMITH PUBLISHING CO.
Atlanta, Ga., and Charlotte, N. C.

Publishers also of *Textile Industries, Electrical South, Southern Hardware, Southern Automotive Journal, Southern Building Supplies,* and *Southern Farm Equipment.*

W. J. Rooke, Chairman of the Board; R. P. Smith, President; E. W. O'Brien, Vice-President; A. E. C. Smith, Vice-President; J. C. Cook, Vice-President; A. F. Roberts, Vice-President; F. P. Bell, Vice-President.

Vol. 77
No. 9

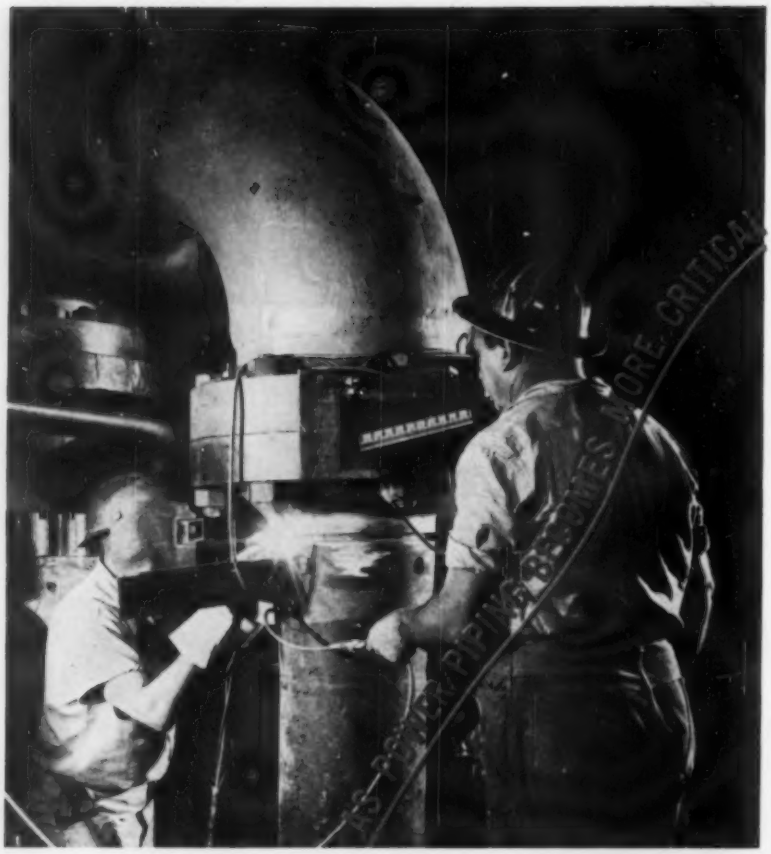
SEPTEMBER, 1959

Photography — A Training Tool 34
Trends in Electric Utility Steam Turbines 38
Salt Damage to Boiler Metal 41
Compiling an Engineering Budget 42
Tanks Salvaged 44
Inside Check on Boiler Tubes 45
Fans — Check Points and Testing 46
Maintenance Welding 48
Texas Boilers — High Position at Low Cost 49
A Roof That Breathes and Leaks 50
Fire Prevention in Virginia Plant 51
Centrifugal Pump Clinic 52
Atomic Development 56
How Many Valves in a Big Plant 60
Maintenance Scheduling 61
Device Cuts Packing Cost 61
Management Clinic 64
Fire Protection 65
Steel for Florida 66
Spun Mineral Wool Conserves Heat 68
Motor Takes It 69

Facts & Trends 6
New Plants & Expansions . . . 24
Industry Speaks 30
Timely Comments 32
Future Events 75
New Product Briefs 80
Catalogs & Bulletins 90
Index to Manufacturers 100

Contents indexed regularly by Engineering Index, Inc.
Copyrighted 1959 by W. R. C. Smith Publishing Company

Address all correspondence to:
Editorial and Executive Offices: **SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E., ATLANTA 8, GA.** *Printed in U.S.A.*



KELLOGG'S K-WELDING IN THE FIELD KEEPS PACE

Once restricted to shop fabrication, K-Weld® has recently been successfully adapted by Kellogg to meet the severest specifications for welding high-pressure-temperature power piping in the field. Currently it is being used in the erection of supercritical piping systems for some of the country's leading steam-electric utilities.

Unique among field welding techniques, K-Weld assures complete penetration of the root bead and a highly uniform internal contour *without backing rings*—through the use of controlled inert gas pressure inside the pipe. The technique can be used on pipe of any type or size during shop fabrication or in the field.

Kellogg welcomes inquiries on K-Weld and its complete service to the power piping industry from consulting engineers, engineers of power generating companies, and manufacturers of boilers, turbines, and allied equipment. An introduction to this service may be obtained by writing for Kellogg's new 12-page booklet, "The Eddystone Story".

As welder lays K-Weld root bead, he carefully controls the pressure of the inert gas. Using this technique, the root bead can be made slightly convex, flush or concave, and the weld deposited with a highly uniform internal contour. No backing rings are needed.

Fabricated Products Sales Division

THE M. W. KELLOGG COMPANY, 711 THIRD AVENUE, NEW YORK 17, N. Y.

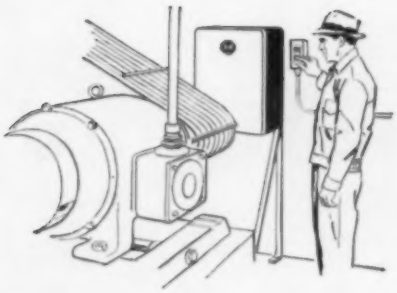
A SUBSIDIARY OF PULLMAN INCORPORATED

The Canadian Kellogg Co., Ltd., Toronto • Kellogg International Corp., London • Kellogg Pan American Corp., Buenos Aires • Societe Kellogg, Paris • Companhia Kellogg Brasileira, Rio de Janeiro • Compania Kellogg de Venezuela, Caracas

KELLOGG

POWER PIPING—THE VITAL LINK

®Registered trademark of the M. W. Kellogg Company, Process Patented

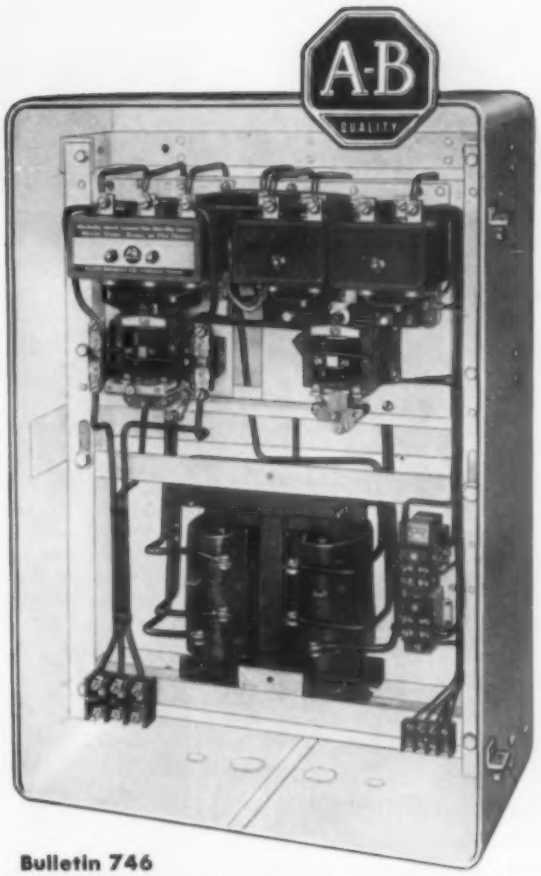


WHEN REDUCED VOLTAGE STARTING IS A MUST

Only Allen-Bradley can provide all the answers

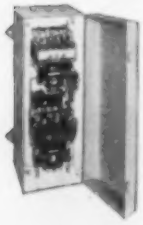
The Allen-Bradley line of reduced voltage starters makes possible a selection of the best starter, not only to meet the power company's requirements but also to provide the best starting conditions for the motor and the "load" that it drives.

The simple solenoid contactors in A-B reduced voltage starters have only ONE moving part—assuring millions of trouble free operations. And their double break, silver alloy contacts never need costly maintenance. Accurate, reliable overload relays protect motors against burnouts. Write for Publication 6088.



Bulletin 746

Automatic reduced voltage starter for squirrel cage motors that should not be started on full line voltage. It employs auto-transformer connected in open delta to reduce line voltage during starting. Adjustable timing relay controls starting period. Taps are provided on the autotransformer to adjust the starting voltage applied to the motor. Maximum ratings to 300 hp, 220 v; 600 hp, 440-550 v.

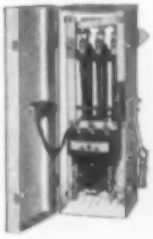


Bulletin 740

Graphite disc resistors are automatically inserted in series with the squirrel cage motor at starting, and they are automatically cut out after a pre-determined time. Turning a single screw on the starter frame adjusts the compression resistors exactly to motor and load conditions for velvet smooth acceleration. Ratings to 200 hp, 220-440-550 v.

Bulletin 640

Where remote control is not needed, these graphite compression disc resistor starters provide stepless acceleration of squirrel cage motors. Operated by hand lever, the smooth starting of the motor is under the control of the operator. No-voltage and dependable overload protection is provided. Ratings to 200 hp, 220-440-550 v.



ALLEN-BRADLEY | QUALITY MOTOR CONTROL

Allen-Bradley Co., 1328 S. Second St., Milwaukee 4, Wis. • In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

CONSULT YOUR LOCAL ALLEN-BRADLEY REPRESENTATIVE

ALBUQUERQUE—A & A Supply Co., 114 Morningside Dr., N. E., Tel: ALpine 6-0307
ATLANTA—Roy E. Wilson Co., 1062 Northside Drive, N.W., Tel: TRinity 6-8833
BALTIMORE—H. M. Wood & Co., Inc., 124 Light St., Tel: MUlberry 5-4643
BIRMINGHAM—J. L. Haworth Co., Inc., 825 S. 22nd St., Tel: FAirfax 3-1171
CHARLESTON—Henry E. Payne, 918 Kanawha Blvd. E., Tel: Dickens 3-1393
CHARLOTTE—LeRoy P. Spoon, 307 Lincoln St., Tel: EDison 4-6334
DALLAS—J. K. Webb, 2810 McKinney Ave., Tel: TAylor 3-6179
HOUSTON—Allen-Bradley Co., 2105 McKinney Ave., Tel: CApitol 5-0747
JACKSONVILLE—Robert P. Smith & Co., 1446 June St., Tel: EXbrook 8-0531
KANSAS CITY—B. L. McCreary & Son, 1819 Central St., Tel: HArrison 1-1668
KNOXVILLE—Bowditch & Co., 1311-C N. Broadway, P. O. Box 3145, Tel: 4-2513
LITTLE ROCK—Curtis H. Stout, Inc., P. O. Box 107, 400 Shall St., FRanklin 4-8201
LOUISVILLE—The Rietzo Company, 2209 S. Floyd St., Tel: MElrose 7-3603
MEMPHIS—Curtis H. Stout of Tennessee, Inc., 718 M&M Bldg., Tel: JAckson 6-7601
MIAMI—Charles R. Lee & Assoc., Inc., 3524 W. Flagler St., Tel: Highland 4-7414
NEW ORLEANS—Robbins & Robbins, 1037 Magazine St., Tel: JAckson 2-5805
PHOENIX—E. P. Weller & Co., 1902 East Roosy Ave., Tel: AMhurst 6-3188
RICHMOND—H. M. Wood & Co., Inc., 2016 Second Ave., Tel: Milton 3-8529
ST. LOUIS—Allen-Bradley Co., 904 N. Grand Blvd., Tel: JEfferson 5-1901
SALT LAKE CITY—Stevens Sales Co., 1482 Major St., Tel: INgersoll 7-5489
SAN DIEGO—James A. Setchell, 301 W. "G" St., Tel: BEImont 3-3981
SHREVEPORT—Curtis H. Stout, Inc., 334 Ricou-Brewster Bldg., Tel: 5-5485
TULSA—John W. Elder Co., 1526 East Fourth St., Tel: Diamond 3-9149

SPI Facts and Trends

September, 1959

◆ STRUBING (Strip Tubing) — Calumet & Hecla, Inc., will start experimental production this fall of light-wall seamless metal tubing that can be shipped in ribbon form and inflated at the point of use.

Inflatability at point of use makes it possible to ship thin-wall tubing economically, since only the tube walls are shipped and not the hole. The process provides an economical means of producing thin-wall tubing of materials and in thicknesses either unavailable today or available only at a prohibitive cost. Field inflatability might make it possible to ship the entire ductwork for the heating system for a 7-room house in a box the size of an orange crate instead of in trailer-truck loads.

◆ SAFETY RECORD — Employees of the Du Pont Company's Chattanooga nylon plant have established a new world's record for industrial safety. They amassed more than 28,750,000 man-hours on the job without a single lost-time injury to any employee.

The new claimants to the title of "the world's safest employees" had to operate the plant with a perfect safety slate for more than five years to do it. Every day they work now adds to the total. There are more than 2,500 employees at the plant.

◆ LIGHTER RAILWAY CARS — Reynolds Metals Company will supply 18,700,000 pounds of aluminum plate and extrusions for the production of 1,205 aluminum railroad cars. The railroad cars, to be built for the Southern Railway System, will represent the first large volume application of aluminum by the railroad industry.

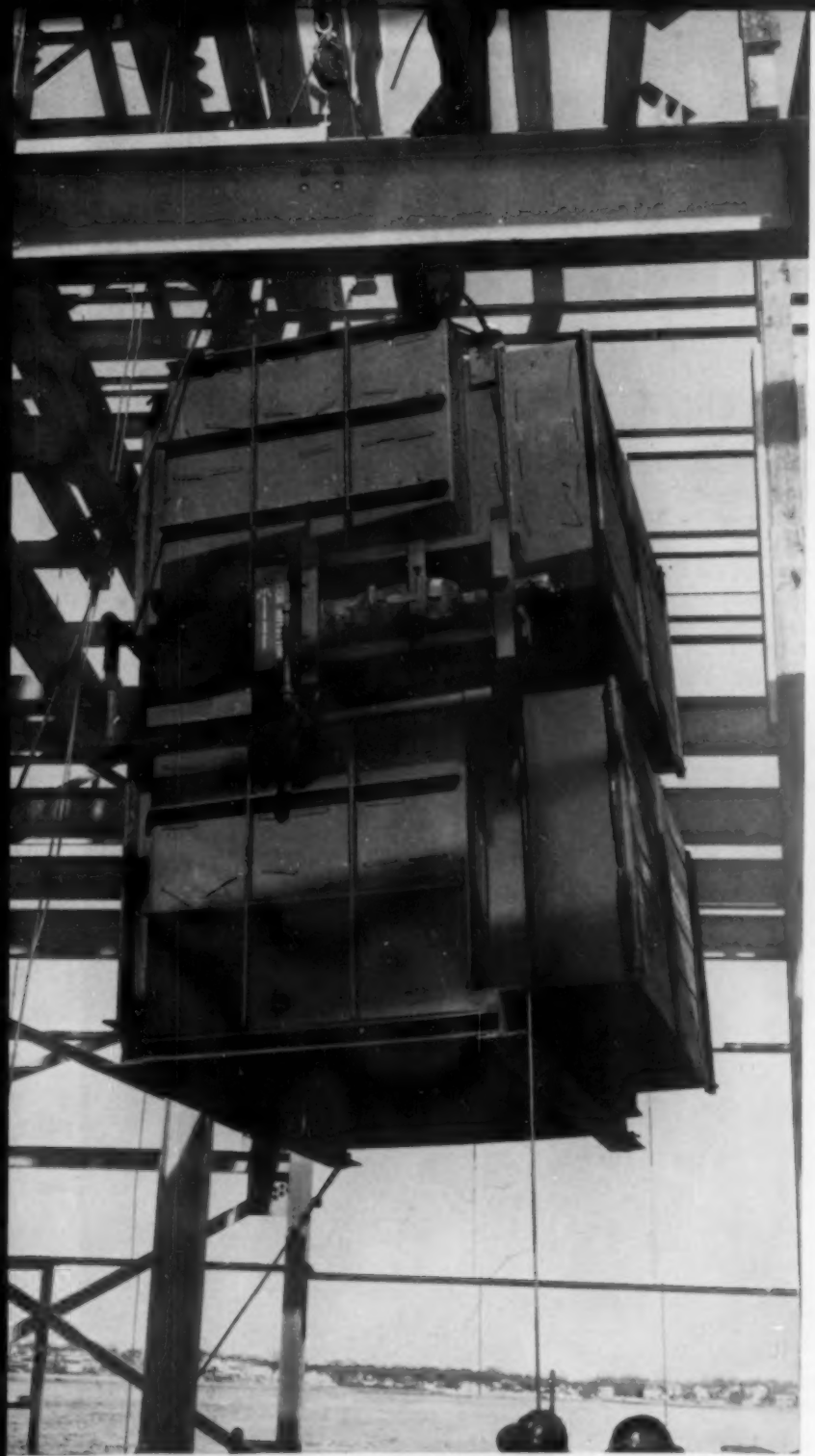
Pullman-Standard, a division of Pullman, Inc., in Bessemer, Ala. will build 750 gondola cars and 455 covered hopper cars will be built by Magor Car Corporation in Clifton, N. J. The aluminum construction will permit increased payloads of from 5 to 8 tons depending on the type of car.

◆ PROFESSIONAL ENGINEERS — More engineers have joined the National Society of Professional Engineers during the past five months than were included in the entire membership of the group during the first five years of its existence.

A total of 4,395 new members were added to the National Society rolls from February 1, 1959 to June 1. Founded in 1934, the Society now has more than 50,000 professional engineers in 50 state societies and some 400 local chapters. The membership increase over the past five months was the largest in the 25-year-history of the Society.

◆ CAUSTIC EMBRITTLEMENT, thirty years ago, was on the tip of every boiler operator's tongue. But you seldom hear the term these days because preventive procedures are now quit generally understood and practiced.

Embrittlement itself, however, is still with us. And it is just as dangerous as ever. It is sly, too — not as easily detected as ordinary corrosion. Seriously affected parts cause sudden failure. "Betz Indicator" of Betz Laboratories reviews



Complete and ready to run, Package Air Preheater is lowered through steelwork of new power station at Braintree, Mass. Installation at Braintree Electric Light Dept. uses largest available package preheater, with a diameter of approximately 12'. Fitted to a 130,000 lb per hr boiler, this Package Air Preheater will boost combustion air temperature by about 420°F with heat recovered from stack gas.

PACKAGE AIR PREHEATER

gives twofold economy at Braintree's new power station

PACKAGE DESIGN FACILITATES INSTALLATION; FUEL SAVINGS TO WRITE OFF COST IN 2 YEARS.

Braintree, Mass., has achieved an economic double-header with the Air Preheater in their new power station:

1. **Initial saving:** The Package Air Preheater, shown above, was delivered as a completely preassembled unit. All it needs is gas ducts and a power line and it's ready to work—installed at a fraction of the time and cost required for conventional units.

2. **Long-term savings:** Records prove that Braintree's Package Air Preheater can pay for itself—just on fuel savings alone—within two years.

Package design gives you these advantages on boilers as small as 25,000 pounds of steam per hour—or as large as 250,000 lbs per hr. And a Package Air Preheater is one of the surest ways to reduce fuel consumption: you cut your fuel bill 1% with every 45-50°F increase in preheated air temperature.

Get all the facts. Write today for your copy of the free 14-page booklet describing the multiple savings you get with a Package Air Preheater.

THE AIR PREHEATER CORPORATION

60 East 42nd Street, New York 17, N. Y.

SUPERIOR

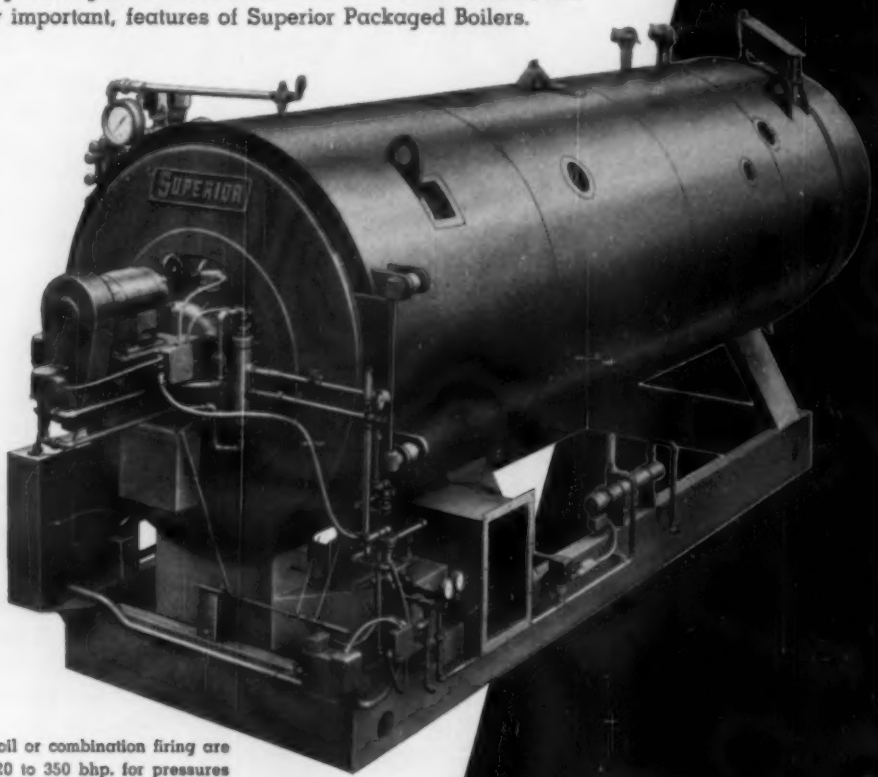
TYPE C

the difference is obvious . . .

Look at that dependable, fully-automatic Superior Rotary Burner; the induced draft, for clean, quiet, safe operation; the boiler itself, carefully engineered and ruggedly built, with four fire-passes, and a full 5 sq. ft. per boiler horse power.

Note the mid-shell location of the furnace . . . not high where it is in danger of low-water failure, and not low where mud build-up could cause bagging or blistering of the furnace.

Ask your engineer about these and other less obvious, but equally important, features of Superior Packaged Boilers.

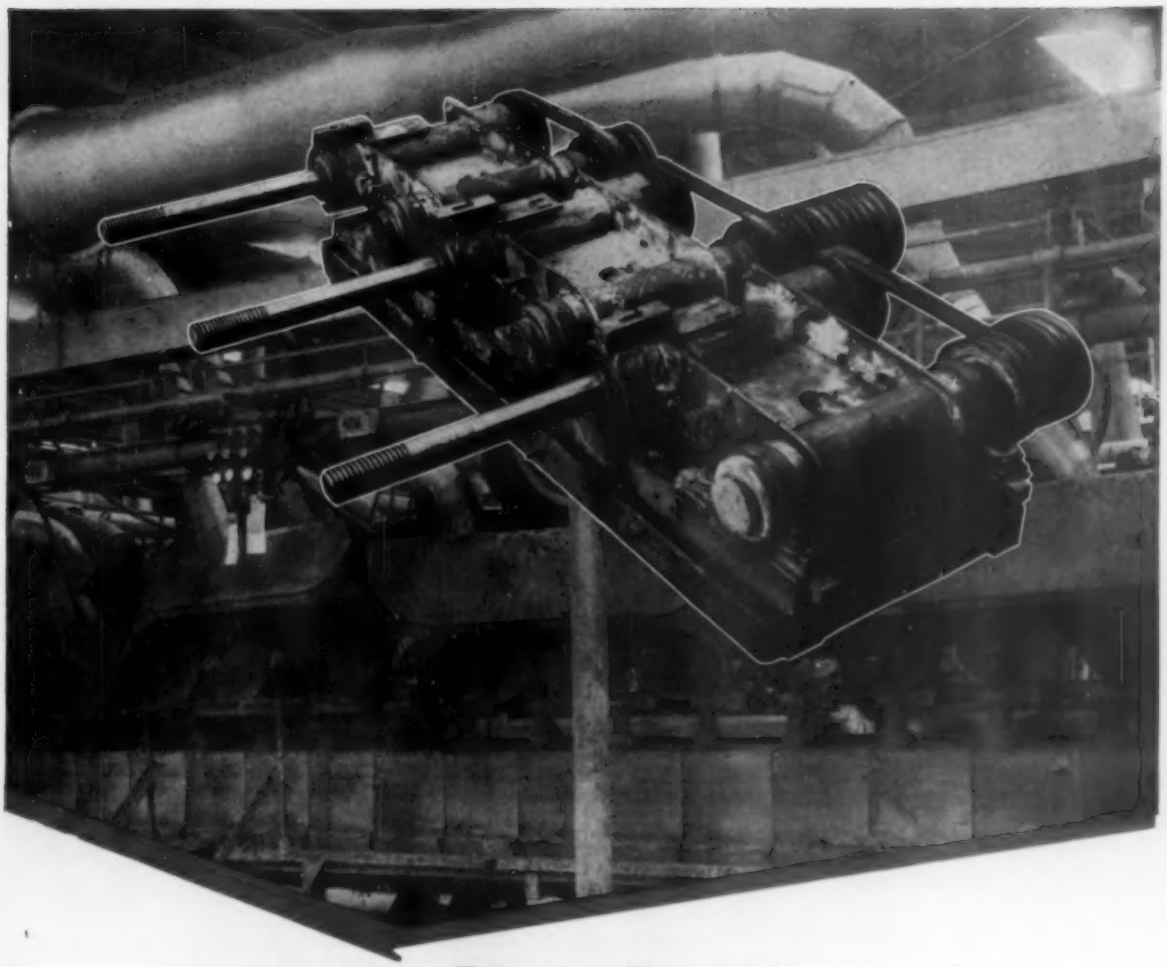


Type C Boilers for gas, oil or combination firing are available in sizes from 20 to 350 bhp. for pressures to 250 psi. Write today for bulletin 15C.
For capacities from 400 to 600 bhp. Write for bulletin 15CF.

Specialists in PACKAGED BOILERS . . . exclusively

SUPERIOR COMBUSTION INDUSTRIES INC.
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

SUPERIOR
PACKAGED BOILERS



Here's a Dixie Bearings idea that saved our customer $3,000 in labor, maintenance and parts in 7 months

Only an authorized bearing distributor such as Dixie Bearings, Inc., with the experience and facilities we have at our disposal, could have designed and supplied the special housings that hold the flinger sealed bearings that now have effectively solved this difficult bearing maintenance problem.

A well known automotive stamping plant designed and built this tandem buffing head (shown above) for its own use. Due to the extremely high concentration of metal dust from the buffing and polishing wheels conventional bearings had a very short life. Over 300 bearings were purchased in 7 months. Downtime due to bearing failure was very costly. The actual labor and material cost of replacing the bearings during this period exceeded $3,000! Since the new bearing units designed by Dixie Bearings (shown enlarged) were installed, no bearing failures have occurred and no replacements have been installed.

Remember Dixie Bearings when you need replacement bearings — Get "factory fresh" bearings of latest design and manufacture. We are *authorized* to sell most famous makes of bearings. We sell *only* those we are authorized to distribute. Call the Dixie Bearings branch nearest you!

DIXIE BEARINGS, INC.

Providing bearing service in the South

FLORIDA: Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville
LOUISIANA: Baton Rouge • New Orleans • **N. CAROLINA:** Charlotte • Greensboro
S. CAROLINA: Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville

the subject in a recent issue. Important reading for the uninitiated, and those that may have forgotten what they learned by hard experience.

◆ PAINTERS WON'T LIKE IT — Aluminum jacketing with a factory-baked enamel color finish was used over insulation on practically all process vessels and pipe lines in The Superior Oil Co.'s new Lowry gas processing plant near Lake Arthur, La.

This is believed to be the first industrial use of the pre-finished colored aluminum as insulation jacketing. Some 25,000 pounds of Reynolds "Colorweld" aluminum, in .016 and .024-in. gauge, were used on the Superior job. Hudson Engineering Corp. of Houston designed and constructed the modern low-temperature plant. All painting of insulated process pipes and vessels on the site was eliminated. Hudson estimated that application of the pre-finished colored aluminum jacketing would be more economical than unpainted metal jacketing with subsequent painting on the site.

◆ HOT WATER JACKET — Pumps will be an imporant element of the world's first offshore sulphur mine, located about seven miles out in the Gulf of Mexico, just off Grand Isle, Louisiana, and operated by the Freeport Sulphur Company. A pipeline will carry molten sulphur from the mine platform, which stands in 50 feet of water, to shore.

The Worthington KCA pumps will handle the hot water (330 F) to be pumped through a line surrounding the sulphur in order to keep it in a molten state. Two steam turbine driven pumps will be located at the mine site. A motor driven model will serve as spare. Without proper hot water pumping equipment, the mine could fail, since the molten sulphur could conceivably cool and become solid in the pipeline.

◆ DIGITAL TELEMETERING — Radiation, Inc., Florida Division, will build for Boeing Airplane Company a multi-million dollar advanced digitial telemetering system for the Minuteman Missile Program.

The equipment to be delivered under this contract represents a major technological advance in the telemetering field and this is the first time that the advantages of digital telemetering will be utilized in an operational missile program. Radiation, Inc. has been a major pioneer in the application of digital techniques to telemetering, having designed and developed the first pulse code modulation telemetering system under Air Force sponsorship in 1954.

◆ NEW PRODUCTS don't mean much in themselves. It is new results that count. That is why we encourage our readers to send in reports on new applications — even if results are not yet conclusive. Manufacturers also are eager to know how their products are standing up in the industrial field.

◆ HARD SURFACING — A new process for hardfacing (spray-welding a Ceramic powder) has just been announced by Republic Hardfacing Corp. who claim that spray-welded Cermet stops the burning effects of exhaust gases, erosion, necking, and corrosion on engine valves. Spray-welded Cermet actually fuses with the parent metal, will not crack or spall under severe shock, heat, wear, or abrasion.

By completely covering the engine head surface with Cermet, the manufacturer claims the valves get all-round protection — out-

(Continued on Page 12)

See Your Nearest DIXISTEEL® Building Dealer

ALABAMA

Anniston
The Concrete Products Co.
520 W. 21st St.
PH: ADams 7-2991

Birmingham
Atlantic Steel Co.
Steel Building Div.
4230 1st Ave., S.
PHONE: WO. 1-2147

Dothan
Hollis & Spann, Contractors
202 S. Alice St.
PHONE: 5-1910

Huntsville
Putman Construction Co.
120 Leeman Ferry Rd., S.W.
PHONE: JEfferson 6-6337

Montgomery
American All Steel Buildings Co., Inc.
1701 Owens St.
PHONE: AMherst 4-3207

J. M. Horner
7 Clayton St.
PHONE: AMherst 5-9309

Piedmont
Ellis-Allen Tractor Co.
104 N. Main St.
PH: GIbson 7-4561

Tuscaloosa
Charles Temerson & Sons
2104 4th St.
PHONE: PL. 2-1504

FLORIDA

Gainesville
H. A. Lee Steel Co.
1800 N.E. 23rd Blvd.
PHONE: FR. 6-7741

Indian Rock Beach
Atlantic Steel Co.
20116 Gulf Blvd.
PHONE: 91-3353

Jacksonville
Atlantic Steel Co.
P. O. Box 2614
PHONE: EXbrook 8-5231

Ormond Beach
Tom Daugherty Steel Bldgs.
666 Buena Vista Ave.
PH: ORange 7-1868

Sarasota
Atlas Construction, Inc.
1027 N. Washington Blvd.
PHONE: RI. 7-0727

Stuart
Sadler Const. Co.
612 South Akron Ave.
PHONE: AT. 7-2353

Tallahassee
J. H. Dowling & Son
703 W. Madison
PHONE: 2-2616

Tampa
Atlantic Steel Co.
Steel Building Div.
4116 N. Armenia Ave.
PHONE: RE. 6-3563

GEORGIA

Atlanta
Atlantic Steel Co.
Steel Building Div.
1300 Mecaslin St., N. W.
PHONE: TR. 5-3441

Augusta
M. H. McKnight & Son Construction Co.
1490 Wrightsboro Road
PHONE: PArk 4-8208

Brunswick
Glynco Steel, Inc.
P. O. Box 331
PHONE: AMherst 5-4511

Columbus
Steel Builders, Inc.
Joy Road
PHONE: FA. 4-2453

Macon
Dixie Metal Co.
2014 Riverside Drive
PHONE: SH. 3-7437

Newnan
Newnan Steel Bldg. Co.
110 E. Washington St.
PHONE: AL. 3-3364

Savannah
Savannah Iron and Fence Corporation
E. President St. Ext.
PHONE: AD. 4-5188

Thomasville
H & H Construction & Supply Co., Inc.
P. O. Box 376
PHONE: CA. 6-8833

Vidalia
Montgery Foundry & Eng. Co.
201 W. 3rd St.
PHONE: 4565

Waycross
Business, Inc.
618 Alice St.
PHONE: AT. 3-8358

NORTH CAROLINA

Charlotte
Roebuck Buildings Co.
2400 Wilkinson Blvd.
PH: FRanklin 5-1294

Raleigh
Ace Steel Bldgs. Co.
P. O. Box 2401
PHONE: TE. 2-6562

Winston-Salem
True Wall Steel Co.
736 E. 28th St.
PHONE: Park 3-2494

SOUTH CAROLINA

Charleston
C. C. Rhodes Lumber Co.
441 Maybank Highway
PHONE: SO. 6-1456

Columbia
Roebuck Bldgs. Co.
726 S. Edisto Ave.
PHONE: AL. 4-2942

Roebuck
Roebuck Bldgs. Co.
Highway 221
PH: Sptnbg. 2-3155

TENNESSEE

Chattanooga
Southern Sales & Export Co.
2010 E. Willow St.
PHONE: OX. 8-2315

Clarksville
Thomason and Reece
College at Second St.
PHONE: MI. 7-1113

Columbia
L. S. White & Co.
1118 South Garden
PHONE: EV. 8-9123

Cookeville
Better Homes Construction Co.
Cox Building
PHONE: 893

Jackson
Hubert M. Owen Const. Co., Inc.
373 N. Cumberland St.
PHONE: 2-3321

Johnson City
J. E. Green Co.
Division St.
PHONE: 707

Knoxville
Industrial Erecting & Contracting Co.
1305-E Broadway, N.E.
Phone 5-9688

Memphis
John Cassidy Const. Co.
801 Roland St.
PHONE: BR. 6-7341

Nashville
Lee Herlinger
4829 Corning Dr.
PHONE: VE. 2-1960

Volunteer Structures, Inc.
4108 Dakota Ave.
PH: CYpress 7-5358

VIRGINIA

Portsmouth
James T. Copley, Inc.
2618 New Suffolk Highway
PHONE: EX. 7-5801

WEST VIRGINIA

Beckley
Meadows Lumber Co., Inc.
701 So. Eisenhower Dr.
PHONE: CLifford 3-5887

Only $2.71 a square foot for this DIXISTEEL® building

This DIXISTEEL Multiple Rigid Frame Building has 41,800 square feet of clear span working area. The complete cost, including sprinkler system, was only $2.71 a square foot.

$3.75 a sq. ft. for this 40 x 60 DIXISTEEL Building, including air conditioning.

$3.87 a sq. ft. for this 100 x 120 DIXISTEEL Lo-Line which makes an ideal clear-span bowling alley.

$3.32 a sq. ft. for this 7,000 sq. ft. DIXISTEEL Building, including air conditioning and all fixtures.

Beautiful DIXISTEEL Buildings offer the easiest, quickest, most economical way to have a modern structure for any type of business . . . from small work shops to large manufacturing plants.

DIXISTEEL Buildings are available in two complete lines: Standard, with a 4/12 roof slope, and the new Lo-Line with a 1½/12 roof slope.

FREE CATALOG!

Write for your copy of this illustrated, descriptive booklet on DIXISTEEL Buildings.

FREE ESTIMATES • NO OBLIGATION
CONVENIENT FINANCING AVAILABLE

HOME OF DIXISTEEL® PRODUCTS

Steel Building Division
Atlantic Steel Company

P.O. Box 1714, Atlanta 1, Georgia • TRinity 5-3441

Facts and Trends — Continued from Page 10

last and outperform any regular valve on the market. By using the same process to spray-weld other hardfacing alloy powders, the manufacturer can also rebuild a variety of worn parts such as spindles, transmission shafts, blades, dies, and pump sleeves.

◆ SMART TAPE — Steam turbine buckets, whose tip speed is faster than sound, are being milled to the most efficient contours ever attained through use of a new tape-controlled machine just installed in General Electric's Large Steam Turbine Generator Department.

Data from blueprints is transferred to punched cards. These, with a program deck are run through an IBM 704 computer and a half-inch magnetic tape is obtained. This is fed into an electronic director which interpolates and transforms the digital data information on velocity, time and directions onto a 1-inch magnetic tape. This one-inch tape, with its continuous tool path information operates through the machine's control system to direct the machine.

◆ BIGGEST GENERATING UNIT — Westinghouse has offered to build for the Tennessee Valley Authority a turbine-generator unit that would produce 800,000 kilowatts and would be the most efficient ever proposed for the TVA System.

This proposal for a steam turbine-generator that would produce 60 per cent more electric power than any machine now being built in this country is possible because of recent technical advances in research, particularly in metallurgy. The two giant steam turbines in this cross-compound unit would contain blades with a greater outside diameter than any ever built before. Coupled to the turbines would be the two largest inner-cooled generators ever built, each rated at 400,000 kilowatts.

◆ AIR CAR — A vehicle without wheels that rides on a cushion of low-pressure air and can travel in any direction over unobstructed terrain or across bodies of waters has been announced by Curtiss-Wright Corp. Maybe you saw a demonstration on TV.

Both suspension and propulsion are accomplished by the use of low-pressure, low-velocity air. The suspension of the vehicle is accomplished through maintaining 1/10 psi under the vehicle augmented by a deflection membrane.

◆ REPRINTS — The editors are just about ready to send to winter quarters their remaining stock of three important recent reprints: "Paint Systems," "Material Handling Case Studies" and "The Chemist's Inspection Reports."

If you want a copy of one or all, please write promptly so we won't have to go into that old dark store room to dig them out.

◆ ALSO — By the time you get over your vacation and are ready to do some constructive thinking our ANNUAL BETTER PRODUCTION issue will be on your desk (about September 28).

This is the annual issue that our readers write. The editors don't have much control of it. They just tell the subscribers that it's time to send in their reports and here they come. This year the plant men are doing right well by us. A great many good short articles from the field are already in hand. Many new proven solutions are described.

Write the editors for additional information on any of the above items. SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 8, Ga.

NEW AMESTEAM GENERATOR

MODEL AA

NEW Lower Cost

NEW Oil Burner

NEW Gas Burner

NEW Compactness

NEW Lower Fuel Costs

NEW Lower Maintenance Costs

NEW More Convenient Controls

. . . OLD AMES DEPENDABILITY

The **NEW** Model AA AMESTEAM GENERATOR offers the ultimate in steam generating efficiency and reliability.

The **NEW**ly designed low pressure air atomizing oil burner will cleanly and uniformly burn all commercial grades of oil — #4 with little or no preheat — for more efficient, economical firing. Since electric pumping and preheat loads are lower, power costs are greatly reduced. For gas firing the **NEW** ring type burner provides a more uniform flame pattern for cleaner, more efficient combustion.

All Model AA AMESTEAM GENERATORS are designed to operate at top efficiency over a modulation range of 20% to 100% of rating.

The Model AA incorporates Ames' time-proven 3-pass concentric tube design, single one-piece baffle and one-piece flue covers. Easier access is provided for inspection and servicing. The **NEW** ultra-compact design simplifies positioning and installation. All units are factory-assembled and fire-tested.

Before you buy a package boiler get the facts on the all **NEW** Model AA AMESTEAM GENERATOR.

AMES IRON WORKS, INC.
OSWEGO, NEW YORK

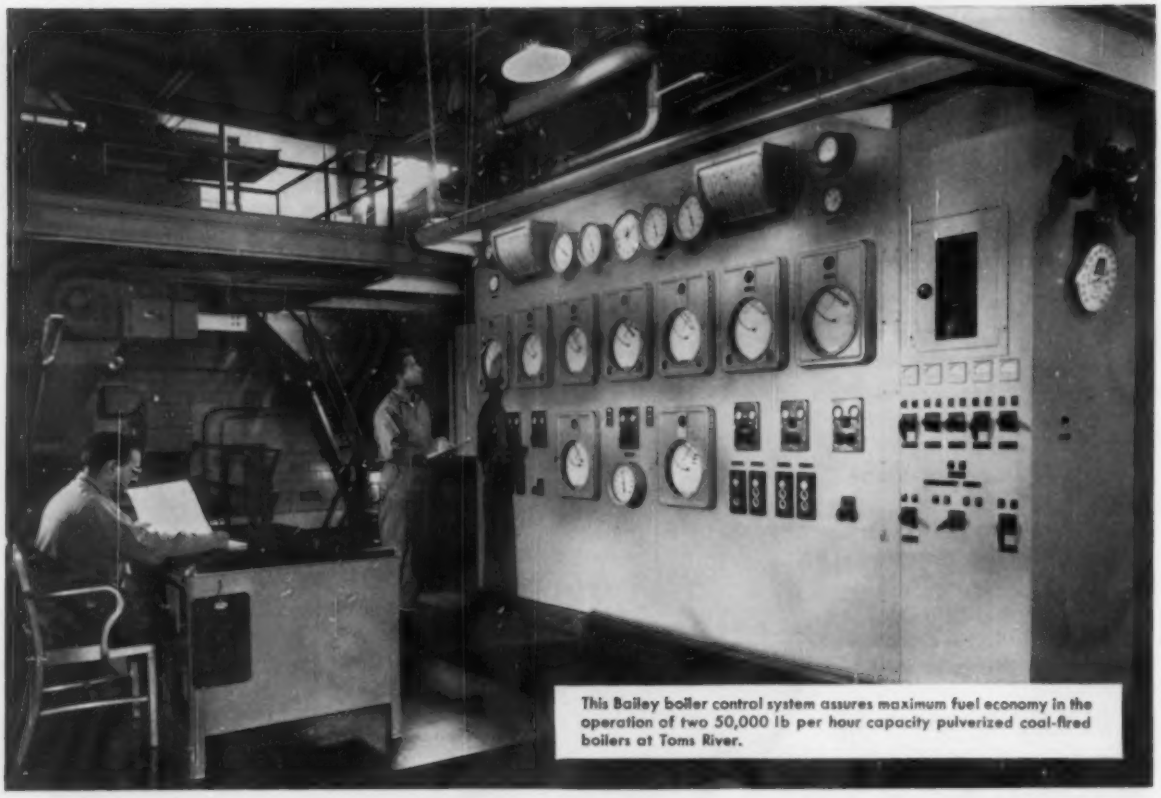
Please send me full details on the **NEW** AMESTEAM GENERATOR Model AA Package Boiler.

NAME & TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



This Bailey boiler control system assures maximum fuel economy in the operation of two 50,000 lb per hour capacity pulverized coal-fired boilers at Toms River.

How Bailey helps control STEAM COSTS AT TOMS RIVER

With a Bailey-engineered control system you can count on a high output of available energy per unit of fuel, whether you operate a small industrial boiler or a large central station boiler.

They did at Toms River — Cincinnati Chemical Corporation's plant in Toms River, N. J.! Bailey Controls help them save fuel by continuously maintaining desired operating conditions.

Most high-efficiency steam generating plants rely on Bailey because:

1. A Complete Line of Equipment

Bailey manufactures a complete line of standard, compatible pneumatic and electric metering and control equipment that has proved itself. Thousands of successful installations involving problems in measurement, combustion and automatic control are your assurance of the best possible system.

2. Experience

Bailey Engineers have been making steam plants work more efficiently for more than forty years. Veteran engineer and young engineer alike, the men who represent Bailey, are storehouses of knowledge on measurement and control. They are up-to-the-minute on the latest developments that can be applied to your problem.

3. Sales and Service Convenient to You

There's a Bailey District Office or Resident Engineer close to you. Check your phone book for expert engineering counsel on your steam plant control problems.

A139-1

BAILEY METERS

Instruments and controls for power and process

BAILEY METER COMPANY

1028 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada — Bailey Meter Company Limited, Montreal

Simplicity in steam traps can effect big savings in parts inventory and maintenance time

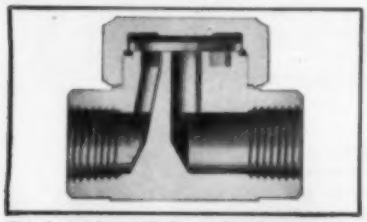
by John W. Ritter, Test Engineer
SARCO Company, Inc.

The function of all steam traps is to release condensate and prevent steam loss. However, the method of trapping can make a great difference in cost and effectiveness.

In the Sarco Thermo-Dynamic Steam Trap, the method is fundamental. Air or condensate entering the trap must flow from the inlet tube, radially across the underside of the disc valve, to the outlet. The space between the inlet tube and the disc forms a nozzle in which the static pressure energy of the incoming fluid is partly changed to velocity across the underside of the disc, with a resultant *decrease* in pressure. (This will be recognized, of course, as the Bernoulli Principle.) Use of this fundamental method means reliability in operation.

As the high velocity fluid jet strikes the side of the upper chamber, some recompression takes place, so that the pressure above the disc becomes greater than the pressure below it. The pressure reduction under the disc and the pressure recovery above it depend on the internal energy of the fluid. As the condensate above nearly approaches steam temperature, its internal energy is enough to overcome the upward force at the inlet tube and the disc snaps down in the inlet tube, which is the inlet valve seat.

Simultaneously, the disc also seals the outer ring, which isolates the space above the disc from the outlet. The disc valve is therefore held firmly against the inlet valve seat until the pressure in the control chamber is reduced by condensation. The upward force then exceeds the downward force and the disc valve opens.



This 3-part Sarco TD Steam Trap has only one moving part—the hardened, polished stainless steel disc.

No other trap uses the velocity of the fluid to operate the valve or uses the recompression of the flowing fluid to trap the valve closed and to hold it closed. When it closes, it closes tightly — no "operating steam" leaks out.

40 seconds inspection time— that's all it takes for a SARCO TD Steam Trap

Just back off the cap of a Sarco TD. Lift out its single moving part, the stainless steel disc. Wipe it off, and drop it back. No adjustment is ever required, at any load or any pressure in its range — from 10 through 600 psi.

The TD operates in any position, won't blow steam at any load. Small as a tee fitting, it can be installed in tight places. Its versatility and reliability cut cost of big replacement inventory.

Write for "Literature Kit 2A" today and get latest bulletins on the TD Steam Trap and other Sarco steam traps. Remember that Sarco can give you impartial advice on *Production Planned steam trapping* because . . .

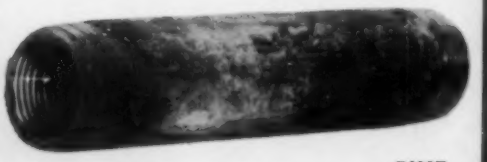
5605-B

SARCO
COMPANY, INC.
635 Madison Ave., New York 22, N. Y.

Only Sarco makes all 5 types:
Thermostatic • Liquid Expansion • Float Thermostatic
Thermo-Dynamic • Bucket

STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS • HEATING SPECIALTIES

don't wait for

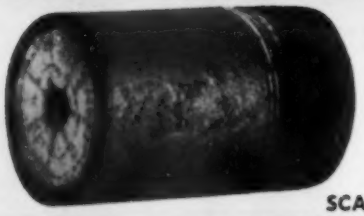


RUST

CORROSION

your lines to

get like these



SCALE

ANDERSON'S WATER-TREATING CHEMICALS

protect your system against scale, rust, corrosion

BRAXON AND FLAKO Specially formulated liquid and dry feedwater treatment that conditions water for the removal and prevention of scaling and corrosion in boilers. Effective boiler water conditioning by phosphate and carbonate control inhibits feedwater tendency to produce foaming and carryover.

KLEERFLO A colorless liquid formula that stops corrosion and scaling in water heaters, storage tanks, pipe, valves and similar equipment. Nontoxic, odorless and tasteless, it can be used freely in water for sanitary or industrial use.

ALKASTEEM Highly developed liquid amine that effectively neutralizes the carbonic acid action which causes corrosion. Protects steam and condensate lines against the corrosive effects of carbon dioxide produced by the breakdown of bicarbonates in the boiler feedwater.

SLUDGIT A liquid fuel oil treatment that removes and prevents sludge in storage tanks. It keeps strainers and burners clean, prevents corrosion, reduces carbon deposit and increases thermal efficiency.

OX-GEM This dry sodium sulfite product prevents pitting and rusting caused by dissolved oxygen in boiler water. This product chemically unites with dissolved oxygen in boiler water to produce a noncorrosive compound.

COOLEX An inexpensive, effective formula to protect metal surfaces against rust, pitting and scale formation. Prevents scale and corrosion in condenser cooling water systems and air washers.

RUSTEX Specially recommended for humidifying systems to prevent corrosion and scale formation in pipe lines, tanks, spray heads and similar equipment. Harmless to personnel, equipment and products.

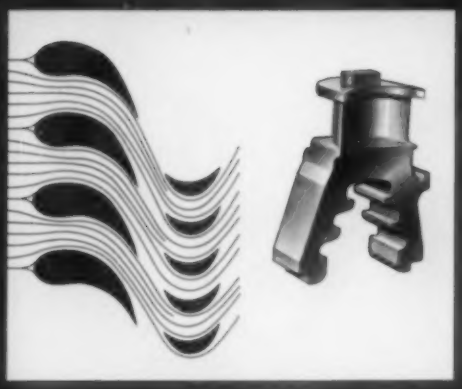
Write today and request an Anderson service engineer to make an analysis and recommendation on your plant's water treatment. There is no cost or obligation to you.

SPECIALISTS IN MAKING WATER BEHAVE

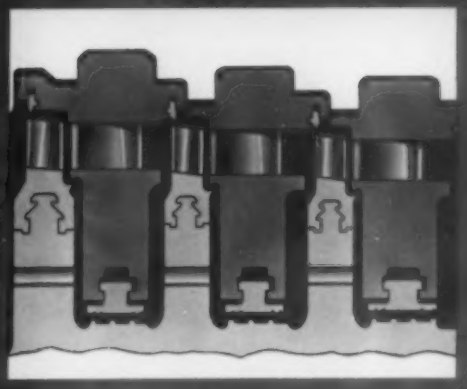
Anderson Chemical Company, INC.

Macon, Ga., Box 1424 • Phone Sherwood 5-0466

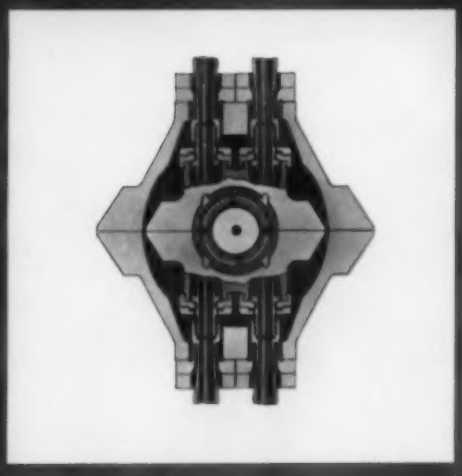
Memphis, Tenn.: Box 2432, DeSoto Station • Phone: BRoadway 2-2806



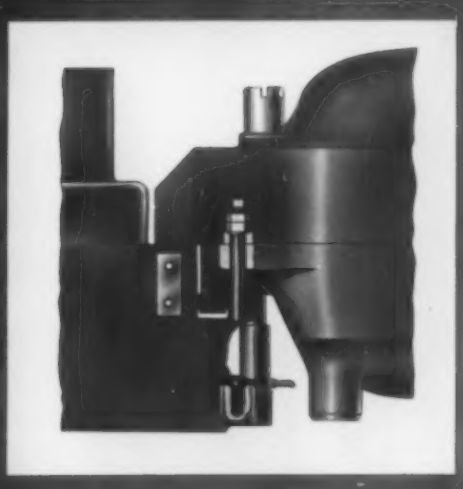
IMPULSE-TYPE STEAM PATH,
RUGGED BUCKET DESIGNS



REMOVABLE RADIAL SPILL STRIPS,
SPRING-BACKED SHAFT PACKING



NOZZLE BOX CONSTRUCTION



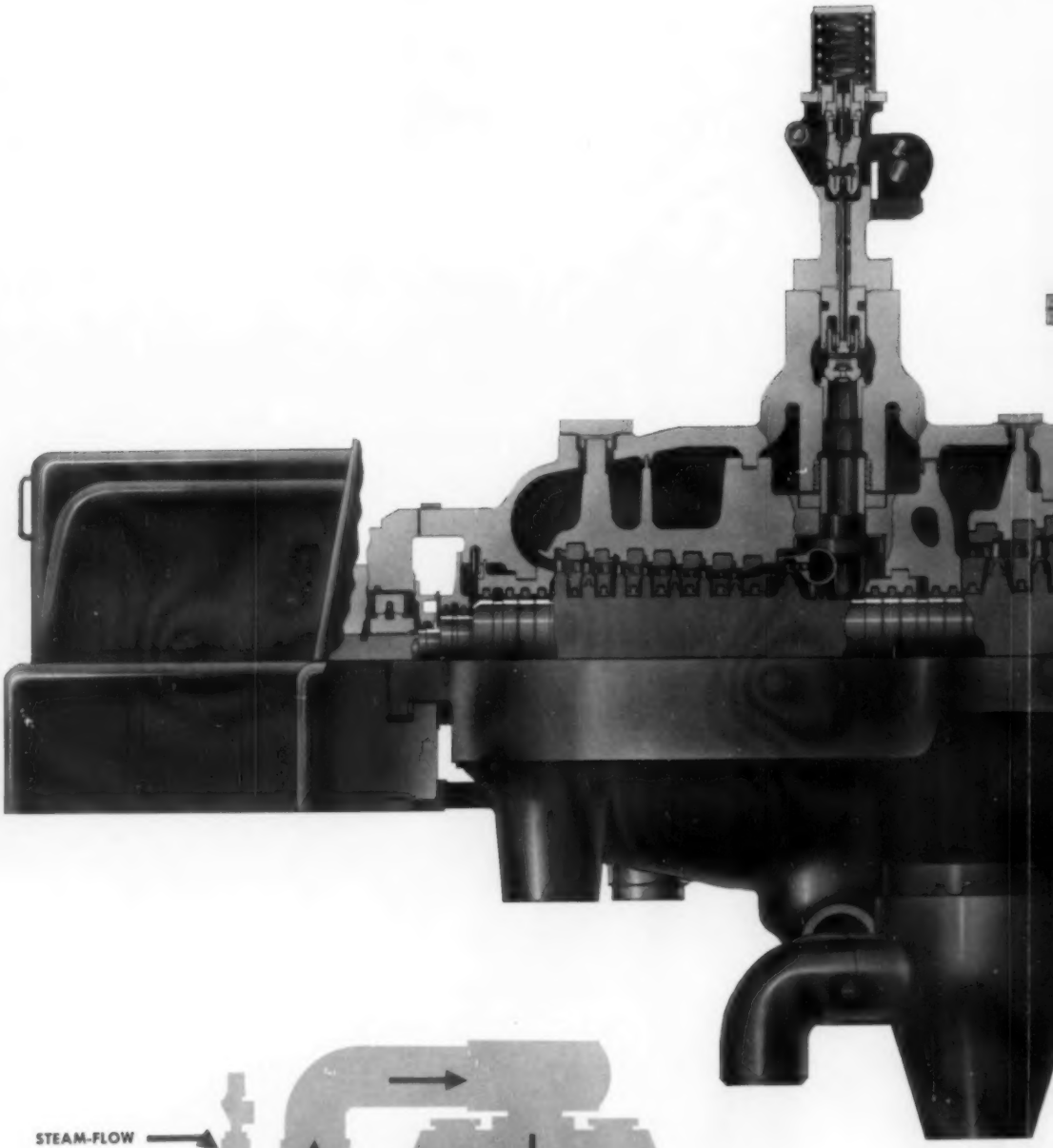
TRUE CENTER-LINE SUPPORT

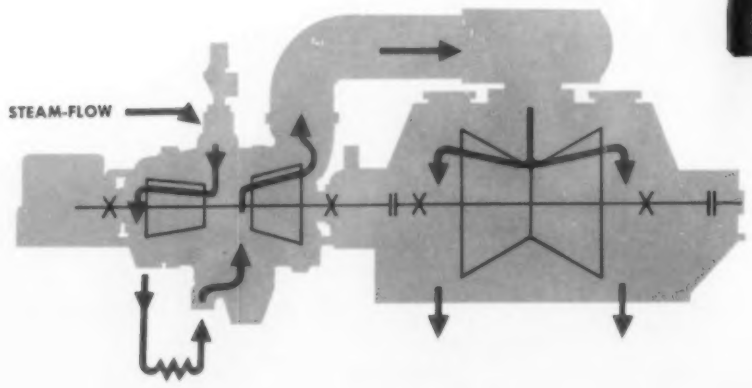
These Important Evaluation Features of General Electric Pre-engineered Steam Turbines Mean...

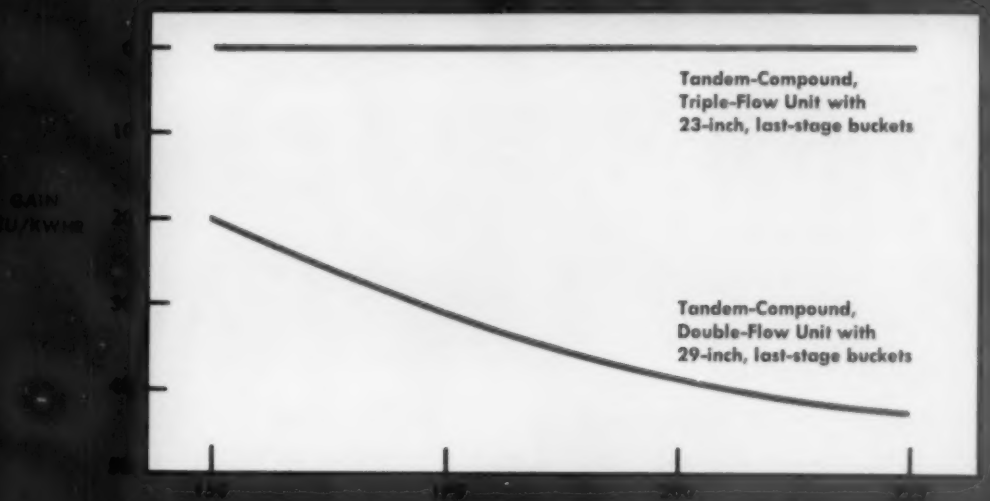
- Minimized Investment
- Improved Performance
- Simplified Operation
- Greater Reliability
- Increased Availability
- Accelerated Installation
- Reduced Maintenance
- Extended Life

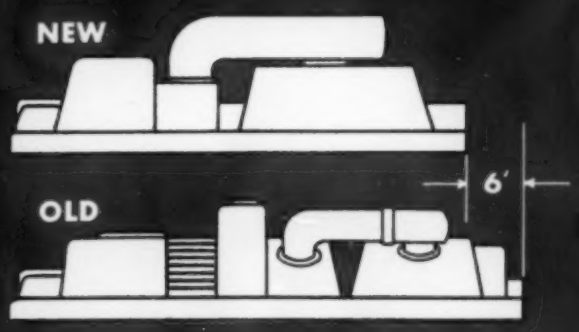
Progress Is Our Most Important Product

GENERAL ELECTRIC




STEAM-FLOW





MORE POWER,
LESS SPACE,
IMPROVED ECONOMY

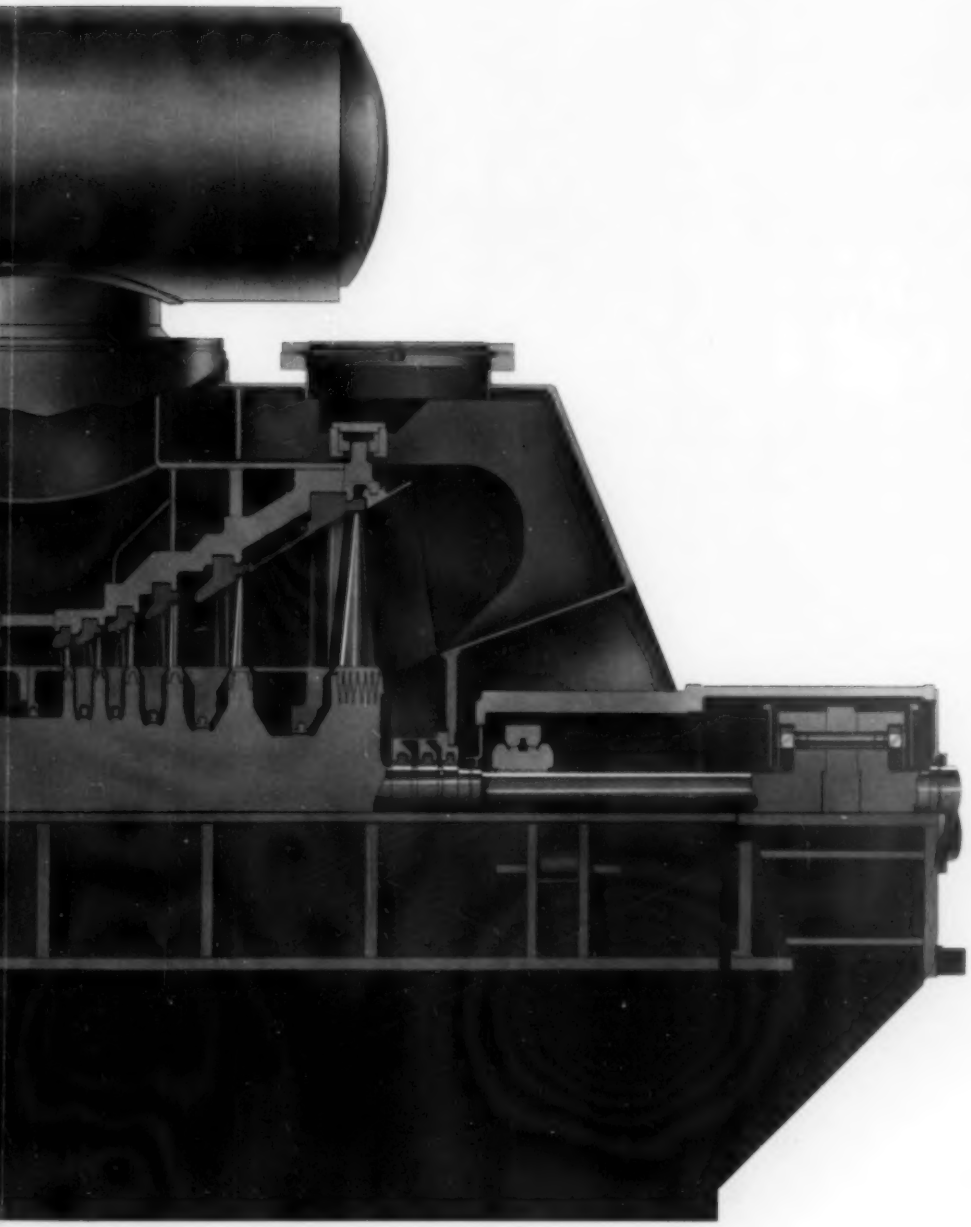
Simplified Design Helps Improve Turbine Economy for the '60's

Inherent simplicity and ruggedness of construction have helped establish the basic double-flow design as a standard concept. Now General Electric's newly designed 3600-rpm, tandem-compound, double-flow, reheat steam turbine, with 29-inch, last-stage buckets – in addition to being more compact with improved heat rate – is adding emphasis to:

- **Smoother operation**—two bearings per rotor span allowing independent balancing, vibration isolation between spans, and shorter front standard;
- **Reliability**—intercept valves close to reheat inlets for controlled overspeed, thrust bearing in middle bearing housing for better balance of bucket-to-nozzle clearances;
- **Accessibility**—one-piece lower and upper half-shell construction, single crossover;
- **Ease of assembly and disassembly**—one less turbine rotor, one less cast steel shell, fewer bearings, packings, and couplings.

This is another of General Electric's pre-engineered turbines for the '60's – turbines which can help you meet ever-increasing power demands. For more information on any of General Electric's large steam turbine-generators, contact your nearest General Electric Apparatus Sales Office. 284-78

GENERAL ELECTRIC

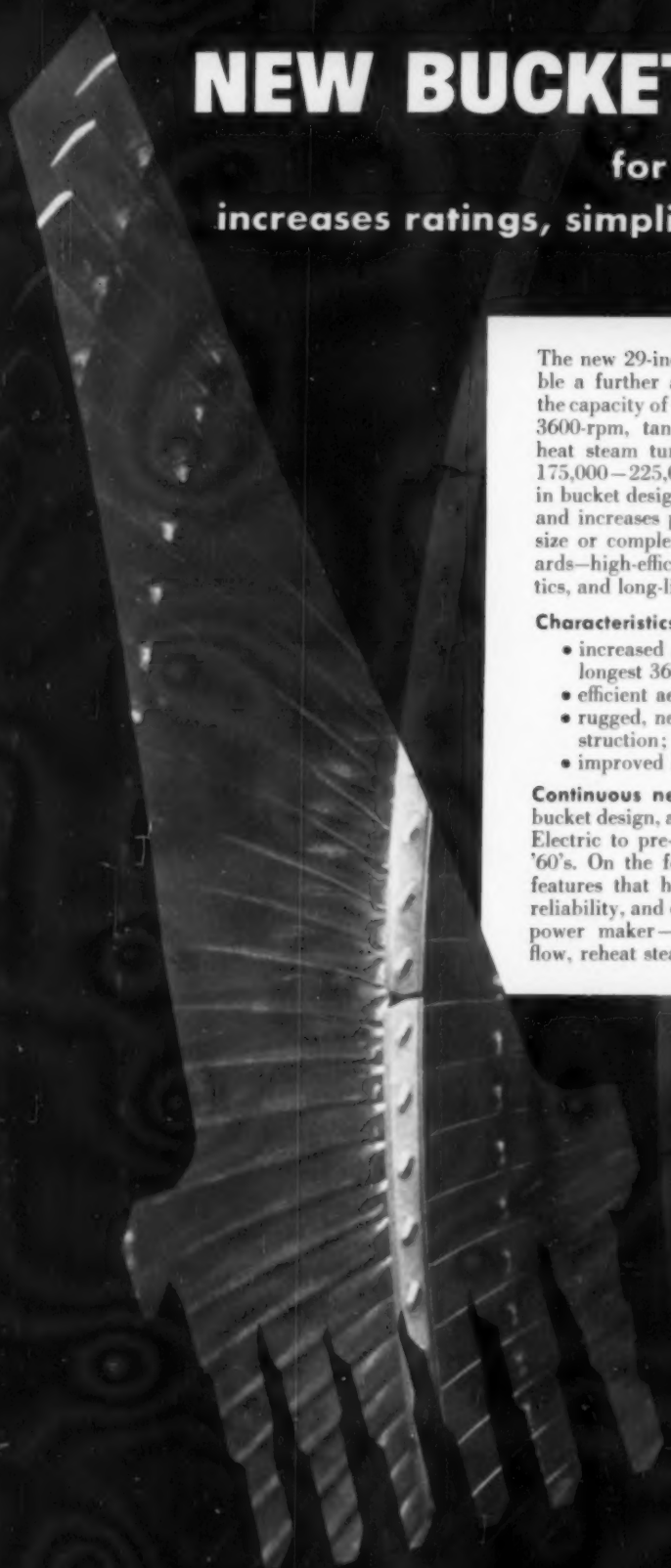


3600-rpm, tandem-compound,
double-flow, reheat steam turbine

GENERAL ELECTRIC

NEW BUCKET DESIGN

for steam turbines . . .
increases ratings, simplifies arrangements



The new 29-inch, last-stage bucket makes possible a further advancement in turbine design—the capacity of General Electric's well-established 3600-rpm, tandem-compound, double-flow, reheat steam turbine can now be raised to the 175,000—225,000-kw range. This new concept in bucket design helps improve turbine heat rate and increases power without increasing turbine size or complexity. Inherent G-E bucket standards—high-efficiency, low-vibration characteristics, and long-life qualities—are maintained.

Characteristics of the advance are:

- increased annulus area over the previously longest 3600-rpm last-stage bucket;
- efficient aerodynamic profile;
- rugged, nested pin-and-finger dovetail construction; and
- improved bucket material.

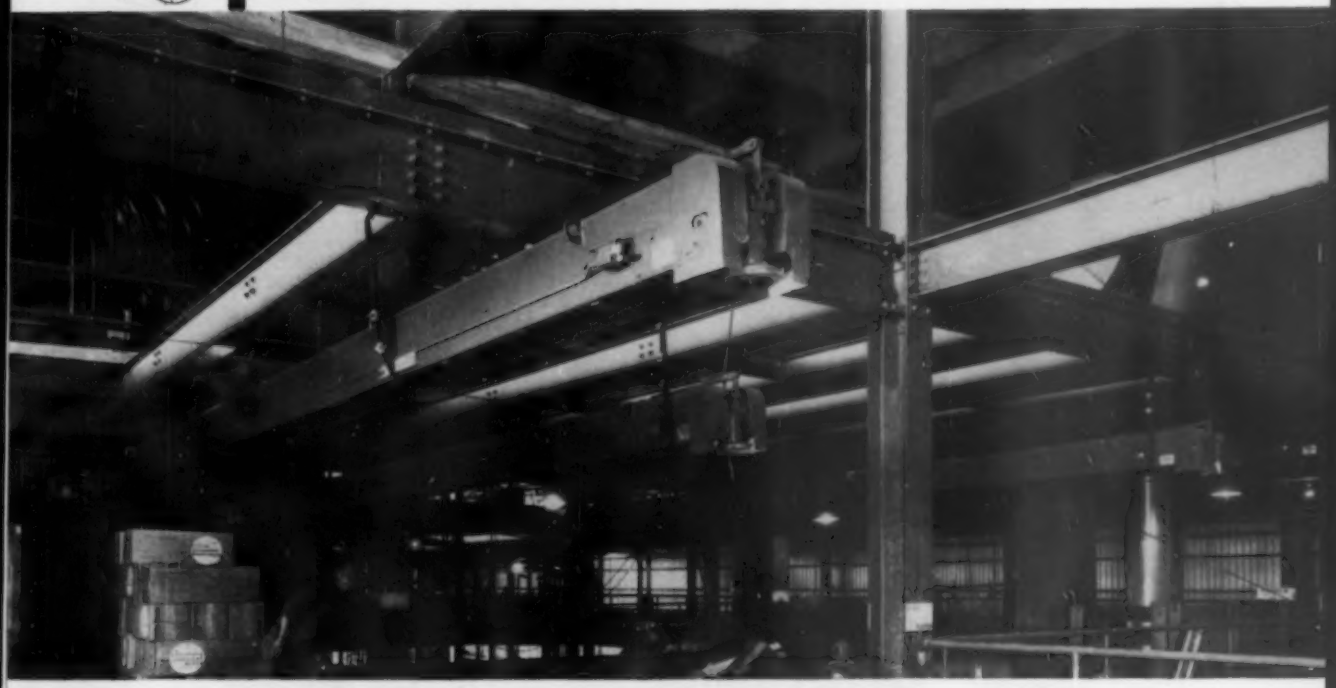
Continuous new developments, such as this bucket design, are making it possible for General Electric to pre-engineer steam turbines for the '60's. On the following pages are more design features that help improve heat rate, increase reliability, and extend ratings of the time-proven power maker—the tandem-compound, double-flow, reheat steam turbine.

GENERAL ELECTRIC

COPES VULCAN

BLAW-KNOX

How Copes-Vulcan control systems boost power plant efficiency



Vulcan T-30's have 30- and 37-foot travels. Motors, mounted at the boiler end, facilitate maintenance, avoid interferences, yet are away from the heat of the boiler. Eddystone Station's Unit 1 has a capacity of 2,000,000 lb/hr at 5000 psig and 1200°/1050°/1050°/F . . . uses C-E Sulzer Monotube Steam Generator.

Vulcan Selective-Sequence system provides Eddystone Station with precision soot blowing

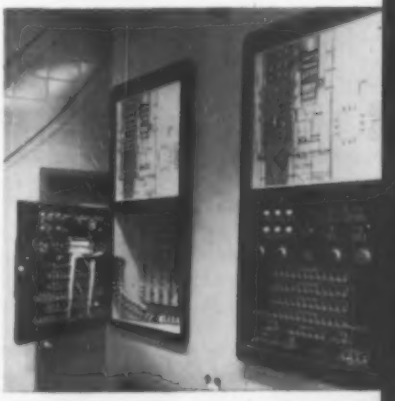
When Unit 1 of Philadelphia Electric's Eddystone Station went into operation, a Vulcan Selective-Sequence system was accurately controlling all soot blowing.

Selective-Sequence systems were chosen for both units 1 and 2 at this super-critical station because they assure positive, dependable boiler cleaning . . . make the most efficient use of the blowing medium.

Vulcan long retractables speed cleaning. With dual-motor drive, Eddystone's T-30's clean uniformly; minimize the danger of tube cutting or erosion. Low rotating speed increases range and penetration of cleaning, decreases wear, eliminates whip, and permits proper cleaning with faster traversing speeds.

Half-'tracts with 19-foot travel, wall deslaggers, and air pre-heater controls are also used.

Panel provides centralized control of soot blowing at Eddystone. With the Vulcan SSC-120 Selective-Sequence controller, each blower can be operated four times during a schedule, or there can be four different schedules. Operator easily monitors the program without leaving the panel, or modifies the sequence without time-consuming wiring and piping changes.

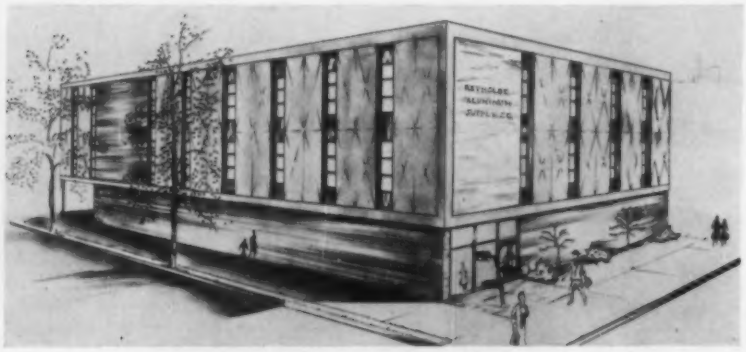


For details, write for Bulletin 1039 on Long Retractable Soot Blowers, Bulletin 1029 on Automatic Soot Blowing Systems, Bulletin 1034 on Wall Deslaggers.

Copes-Vulcan Division
BLAW-KNOX COMPANY
Erie 4, Pennsylvania

the SOUTH—SOUTHWEST

more power . . . more plants . . . more money



Reynolds Aluminum Supply — Atlanta Expansion

A three-story, 15,750 sq ft office building for **Reynolds Aluminum Supply Company** headquarters is underway in Atlanta, Ga.

Major departments to be in the new building will be Executive, Central Accounting, Advertising, Sales, Traffic, Personnel and Engineering. Other Atlanta operations of Reynolds Aluminum Supply Company include a warehouse at 1530 Ellsworth Drive, N.E. and a manufacturing plant at the same address. The Atlanta plant has two 300 foot paint lines producing "Colorweld" baked enameled aluminum coils.

The company also manufactures light and heavy gauge steel drums for the chemical and naval stores industries at their Birmingham, Alabama plant.

In addition to Atlanta, Reynolds Aluminum Supply Company has warehouses in Birmingham, Louisville, Jacksonville, Memphis, Miami, Nashville, Raleigh, Richmond and Savannah.

Poultry Processing Plant — Douglas, Ga.

Plans are underway for construction of a $100,000 poultry processing plant, to be known as **Crider Poultry Processing Plant,** in Douglas, Ga.

According to W. A. Crider, the plant is expected to be completed by the first of the year.

Ala. Expansion for Minn. Mining & Mfg.

Minnesota Mining & Manufacturing Co. is getting underway with plans to expand its Guin, Ala., reflective products plant by approximately 45,000 sq ft which will be used for warehousing as well as the production of reflective sheeting and marking films.

Harry Heltzer, general manager of 3M's reflective products division, said the new facilities are expected to be in operation by early 1960.

According to W. C. Bohn, plant manager, between 30 and 40 workers will be added to the payroll when the new facilities reach full production. The plant presently employs about 100 people. The M. H. Rowell Construction Co. of Guin will be general contractor.

CB&I — Tex. Expansion

Chicago Bridge & Iron Company, Chicago, has announced plans to add a 100-by-500 foot building and a "pickling" facility to its plant near Houston, Texas. A CB&I spokesman said this construction would complete a $1,000,000 expansion program started two years ago.

The new building will house the plant's fabricating and erecting equipment. The pickling facility will be used to remove excess mill scale from steel plates and shapes utilized in the fabrication of large capacity storage vessels and processing equipment.

Spencer Expanding Polyethylene Plant

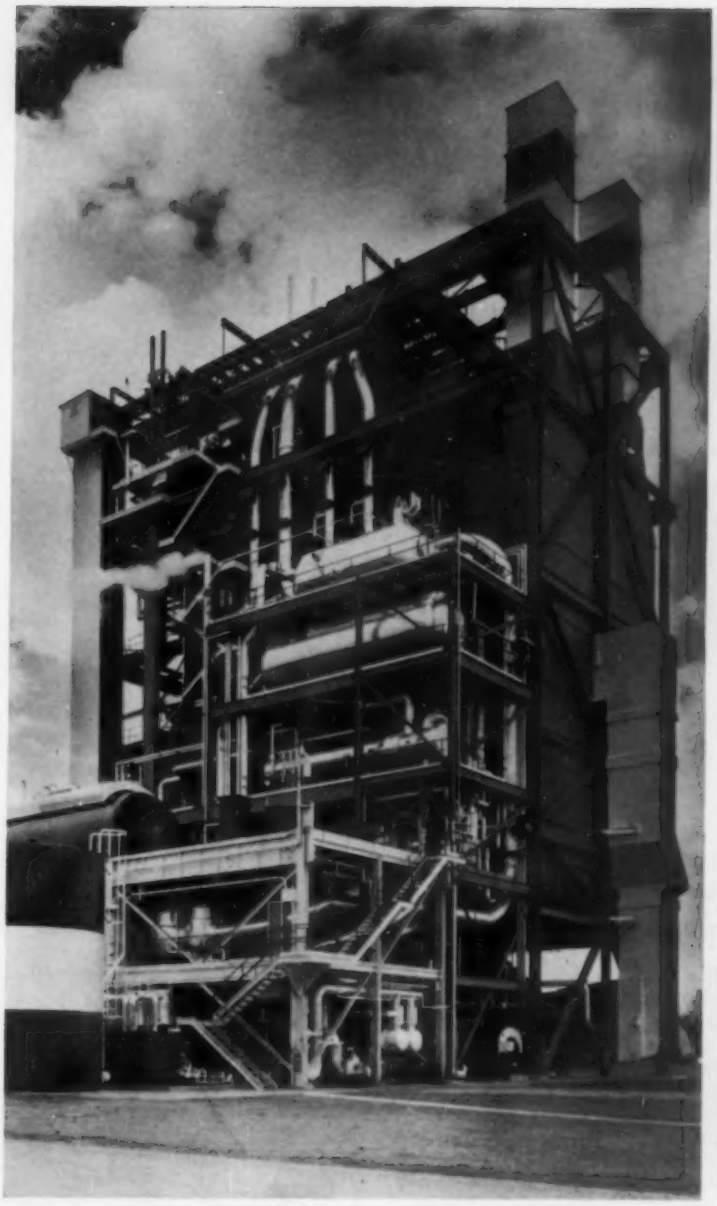
Spencer Chemical Company has begun the expansion of its Orange, Tex. polyethylene plant, according to Kenneth A. Spencer, President, The expansion is expected to be completed by the summer of 1960. Cost estimates were not disclosed.

This expansion is the second major one since the Orange, Texas, plant opened in 1955. The new polyethylene units will be of the same high pressure process initially installed by Spencer to produce a variety of polyethylene products of low and medium density.

Chemstrand Corp. Research Center—N. C.

Wigton-Abbott Corporation, Plainfield, N. J., has been retained by the **Chemstrand Corporation** as architect-engineer for the company's new Research Center.

The multi-million dollar facility will be built in the Research Triangle Park of North Carolina with occupancy scheduled for late 1960. Research facilities, presently located in Decatur, Ala., will be moved to the new site.



Texas Power and Light Company's Stryker Creek Station, located in Cherokee County, Texas. This 125Mw station, one of the newest and best looking outdoor installations, is equipped with Hagan combustion and 3-element feed water control plus all principal metering. Operating at 1875 psi and 1005F, the station is on automatic load control and has to follow wide and rapid load changes.

3-element Feed Water Control. Recently, the station experienced a generator trip-out, and the 3-element feed water system was left on automatic. Inspection of charts after the difficulty was overcome showed that the system had maintained proper drum level throughout the two hour outage, going through the complete shut-down, start-up cycle.

The station uses natural gas as its primary fuel, with oil as standby. The Hagan oil and gas flow recorders and transmitters shown here demonstrate the rugged nature of Hagan equipment, and its ability to stand up to the test of outdoor installation.

Hagan Controls at this Texas Power & Light Station

follow rapid load changes on full automatic

Texas Power and Light Company's Stryker Creek Station experiences wide and rapid load changes. The Hagan control systems enable the station to follow each change in demand instantly. The Hagan master sender, heart of the combustion control system, establishes burner differential and windbox pressure in parallel, eliminating the lag which occurs when one follows the other.

Hagan systems have established many such records. A Hagan engineer will be glad to show you how these controls can help make your installation more efficient and economical.

HAGAN CHEMICALS & CONTROLS, INC.

DIVISIONS: CALGON COMPANY, HALL LABORATORIES

HAGAN BUILDING, PITTSBURGH 30, PA.

In Canada: Hagan Corporation (Canada) Limited, Toronto
European Division: Via Plumendosa No. 13, Milano, Italy

$1.5 Million Conso Plant Underway — S. C.

Consolidated Trimming Corp. of New York, world's largest manufacturer of drapery trimmings and accessories, is constructing a $1,500,000 plant for **Conso Fastener Corp.** at Union, South Carolina.

Daniel Construction Co. of New York is general contractor.

Dallas Office for Core Labs

Core Laboratories, Inc., international petroleum reservoir engineering concern, has announced plans to build a $750,000 home office building in Dallas, Tex.

President John D. Wisenbaker said the 40,000 sq ft, 2-story structure will be located on a 4-acre tract and will house the company's administrative, engineering and consulting, core analysis, reservoir fluid, data processing, research, accounting, and equipment development sections.

The building is expected to be ready for occupancy early in 1960. Architectural design, mechanical engineering and construction supervision are being handled by Harwood K. Smith & Partners, Dallas.

Concrete Products Plant for El Paso

Nearing completion in El Paso, Tex. is new concrete building products plant for **Hal B. Hayes Co.** of Los Angeles and **American Pozzalan Co.,** a subsidiary of Halliburton Oil Well Cementing Co., according to A. T. Locke, general manager for Hayes, and Henry Mussman, El Paso manager for Halliburton Co.

Mussman, who has been named general manager of the concrete products plant, said only the latest and most modern equipment is being used. Most of the equipment is being manufactured by the Stearns Manufacturing Co. of Adrian, Mich., one of the foremost producers of concrete building products equipment.

The plant and necessary adjuncts will spread over some 17 acres of land of the Halliburton Co. or leased from the City. Although the operation is a semi-outdoor activity, at least 50,000 to 60,000 square feet of space will be under roof.

Chesapeake Corp. — Power Plant Addition

Tidewater Construction Company of Norfolk, has been awarded the low-bid contract for an addition to the power plant at **The Chesapeake Corporation of Virginia,** West Point, Va. The addition will house a new 12,500-kilowatt turbine generator.

Erik Zimmerman, vice president and production manager, said the Norfolk firm will construct the foundation and building and install machinery and equipment, exclusive of process piping and electrical work. Contracts for piping and electrical work are expected to be let in the late summer.

Tidewater's contract involves more than $250,000 worth of construction. However, the power plant addition, including the generator and other work, involves more than $2,000,000. Chesapeake generates within its own facilities all of the steam and electric power used in its pulp and paper manufacture.

A. C. Woods Associates, of Philadelphia, consultants to the company, are handling the design and engineering work in collaboration with company engineers, according to R. M. Tokarz, plant engineer for Chesapeake. John Peters, of Tidewater Construction, will supervise the general contracting.

The building will be ready to receive the new turbine by mid-February of next year. The generator is expected to be in operation by August, 1960. One of eight generators now operating will be retired, but the new one will increase the power plant's over-all capacity and add to load flexibility.

Amp Inc. To Build in Greensboro, N. C.

Plans are underway for construction of a plant, containing 40,000 sq ft of floor space, on a 32 acre site in Greensboro, N. C. for **Amp Inc.**

Upon its completion in November the plant will manufacture 100 million electrical terminals per month. Basically it will engage in stamping and plating.

The company's main plant is at Harrisburg, Pa. The company plans to more or less duplicate its Pennsylvania operations in North Carolina plants, with the Greensboro installation serving as the mother plant.

Century Elec. Motor Plant for Tennessee

Plans are underway for a new motor plant for **Century Electric Company,** on a site at McMinnville, Tennessee.

The new plant is part of Century's growth program, and is an additional Century manufacturing facility. The new plant will enable Century to expand its motor line, and will increase present volume output.

Motor production in St. Louis, where the company is headquartered, will continue and even increase its present production rate.

Checking, inspecting and adjusting mechanism used in plant's electrical system.

Westinghouse furnishes a written report of the condition of all electrical equipment and recommendations on parts and repairs.

"now operating"... with a WESTINGHOUSE MAINTENANCE CONTRACT

Florida Steel Corporation in Tampa, Florida, started operations in September, 1958.

Mr. R. R. Black, Sr., General Manager, contracted with Westinghouse for a complete maintenance inspection and engineering service on a quarterly basis. He reports, "Our experience to date has proved to us that our Westinghouse Maintenance Contract has already paid for itself many times. Down time is at a minimum, and when troubles develop, we are assured of fast, capable service."

You can now have a Westinghouse maintenance engineer check and test all of your electrical equipment under contract—weekly, monthly or yearly, depending on your needs. These scheduled inspection recommendations and adjustments can prevent equipment failure, reduce outages and down time to a minimum.

For complete information, call or write Westinghouse Electric Corporation, 1299 Northside Drive, N. W., P. O. Box 4808, Atlanta 2, Georgia. J-95206

YOU CAN BE SURE...IF IT'S

Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV FRIDAYS

Contract service offered in Westinghouse Southeastern Region Only.

News of the South-Southwest — more power . . . more plants . . . more money

Trailmobile Branch for Florida

A $350,000 branch of **Trailmobile Inc.**, the nation's second largest manufacturer, distributor, and servicer of giant cargo trailers, has been opened in Jacksonville, Florida.

The new building, located at 351 South Edgewood Avenue, has 11,600 sq ft of floor space and is situated on a 4.2 acre site which includes a fenced area to accommodate 103 of the large trailers. Thirty-two people are presently employed at the branch.

Bay Petroleum Expands in Texas

Underway for **Bay Petroleum Company**, a division of Tennessee Gas Transmission Company, is a natural gas processing plant on a 30 acre site on Copano Bay near Rockport, Texas.

The contract was awarded to the O. L. Olsen Company of Houston. The plant is expected to begin operations in the fall.

Designed to process a maximum of 50 million cubic feet of natural gas per day, the plant will extract a mixed stream of propane, normal butane, iso-butane and natural gasoline, with daily production estimated at 32,800 to 42,000 gallons.

The plant's entire output will be delivered to Bay's liquid hydrocarbons fractionating plant near La Porte, Texas. A 12-mile, 4-inch pipeline will be laid from the Copano Bay site to connect with a products pipeline which Bay operates along the Texas Gulf Coast.

Plastics Plant — Tex.

Recently completed for **Loma Plastics, Inc.** of Fort Worth, Texas is a 75,000 sq ft brick structure at its 50 acre factory and office site which will serve as a warehouse. A similar structure is being erected to to house production machinery.

Plans are underway for construction of modern offices to accommodate 40 or more people.

Importing Center — Charleston, S. C.

Construction of an $854,352 importing center for **Stein Hall Company** is underway and expected to open in December.

When finished, the plant and warehouse will be a 40,000 sq ft structure. It is situated at the Port Authority's Union Pier Terminals in downtown Charleston, S. C.

Ruscon Construction Company is the prime contractor of the project.

Stein Hall will import, distribute, and process some of its products at the specialized plant.

$500,000 Sulphur Facility — Tampa

The Pan American Sulphur Company is constructing a $500,000 dry bulk and liquid sulphur storage facility at Tampa, Fla.

Total liquid and dry bulk storage capacity of the proposed facility will approximate 65,000 gross tons at all times, and it is anticipated that some 200,000 tons of sulphur will be handled through the installation each year.

Following several months of planning and general surveying of the area requirements, Pan American has now completed its design and engineering program. The plant will be capable of handling up to 300,000 tons annually — both dry bulk and liquid.

Purex Plant — Atlanta, Ga.

The Purex Corporation, Ltd., manufacturer of household cleaning products, has signed a contract for the construction of a new manufacturing, warehousing and office building in the "Central of Georgia" industrial district of the Atlanta, Ga. area, according to Ed Carrigan, Superintendent of the present Purex plant in East Point. Timothy J. McCarthy and Fred J. Moore will handle the construction.

The new facility will be of brick construction with stone trim. It will contain 30,000 sq ft of warehousing and manufacturing space and a 1,600 sq ft, air-conditioned office area. Present plans call for completion of the project by October 15th.

The structure will be situated on a 4½ acre site, providing ample space for additional expansion in the future.

Mobile Homes Plant for Denton

Construction for a $52,000 Denton plant to house a mobile home manufacturing company is near completion. The new plant for **Foremost Mobile Homes Mfg. Corp.** is being constructed on a 5 acre tract in Shady Oaks Industrial Park in Denton, Tex. Actually the plant is composed of two buildings, totaling 22,800 square feet. The main trailer assembling area is in a 60 x 300 foot building and the paint shop is in a 60 x 80 foot building. Masonry construction is being used.

Guest said that his firm expects to assemble at least three mobile homes daily after operations are actually underway. About 75 employees will be employed at first with the number increasing to about 125.

Elastic Yarn Plant — Tenn.

Underway in Chattanooga, Tenn. is a $200,000 branch plant for **Elastic Corp.** of Hickory, N. C. which will manufacture elastic yarn for the hosiery and weaving trades.

(*Continued on Page* 75)

POWELL has high pressure

high temperature valves in stock for quick delivery

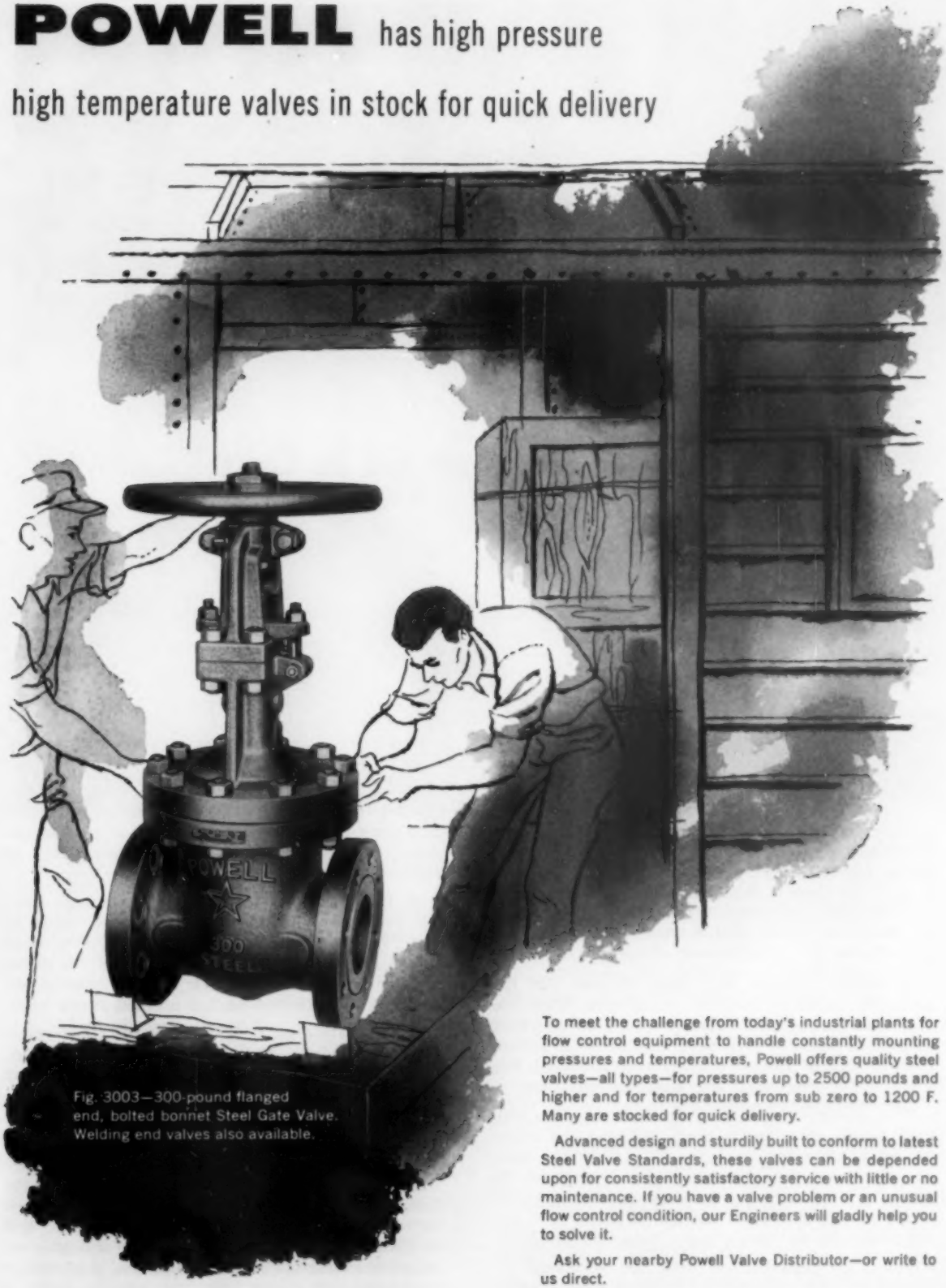


Fig. 3003—300-pound flanged end, bolted bonnet Steel Gate Valve. Welding end valves also available.

To meet the challenge from today's industrial plants for flow control equipment to handle constantly mounting pressures and temperatures, Powell offers quality steel valves—all types—for pressures up to 2500 pounds and higher and for temperatures from sub zero to 1200 F. Many are stocked for quick delivery.

Advanced design and sturdily built to conform to latest Steel Valve Standards, these valves can be depended upon for consistently satisfactory service with little or no maintenance. If you have a valve problem or an unusual flow control condition, our Engineers will gladly help you to solve it.

Ask your nearby Powell Valve Distributor—or write to us direct.

THE WM. POWELL COMPANY DEPENDABLE VALVES SINCE 1846 CINCINNATI 22, OHIO **world's largest family of valves**

INDUSTRY SPEAKS

The Drinking Problem and Its Control

A BOOK springing from the Du Pont Company's success in rehabilitating alcoholics among its employees has been written by Dr. C. A. D'Alonzo, assistant director of the Medical Division, as a guide to control of alcoholism by individuals and organizations.

Titled "The Drinking Problem and Its Control," the 130-page book has just been published by the Gulf Publishing Company of Houston, Texas.

Du Pont inaugurated an experimental plan of rehabilitating alcoholics 15 years ago as part of its preventive medical program for employees. It succeeded beyond expectation, saving the health, sanity, or even the lives of more than 900 men and women in that time. Its effectiveness has inspired other organizations in the United States and Canada to similar efforts.

A deliberate effort was made to seek out the alcoholics so they could be rehabilitated. Over the years 1,254 cases were "discovered." More than half of them — 690 — have been rehabilitated and almost 20 per cent more — 240 — were improved. For the rest the situation is unchanged or unknown.

It is significant that both the book and the program which generated it apply to living and working conditions which are normal. Du Pont's problem of alcoholism among employees is typical of the nation as a whole rather than exceptional. Its 85,000 employees form a cross section of the public and the proportion of them who are alcoholics is average.

From the beginning in 1944, the work has involved two parallel activities: general work through management and employees to spread the idea and break down stigmas attached to alcoholism, and direct work with alcoholics through Alcoholics Anonymous to rehabilitate them.

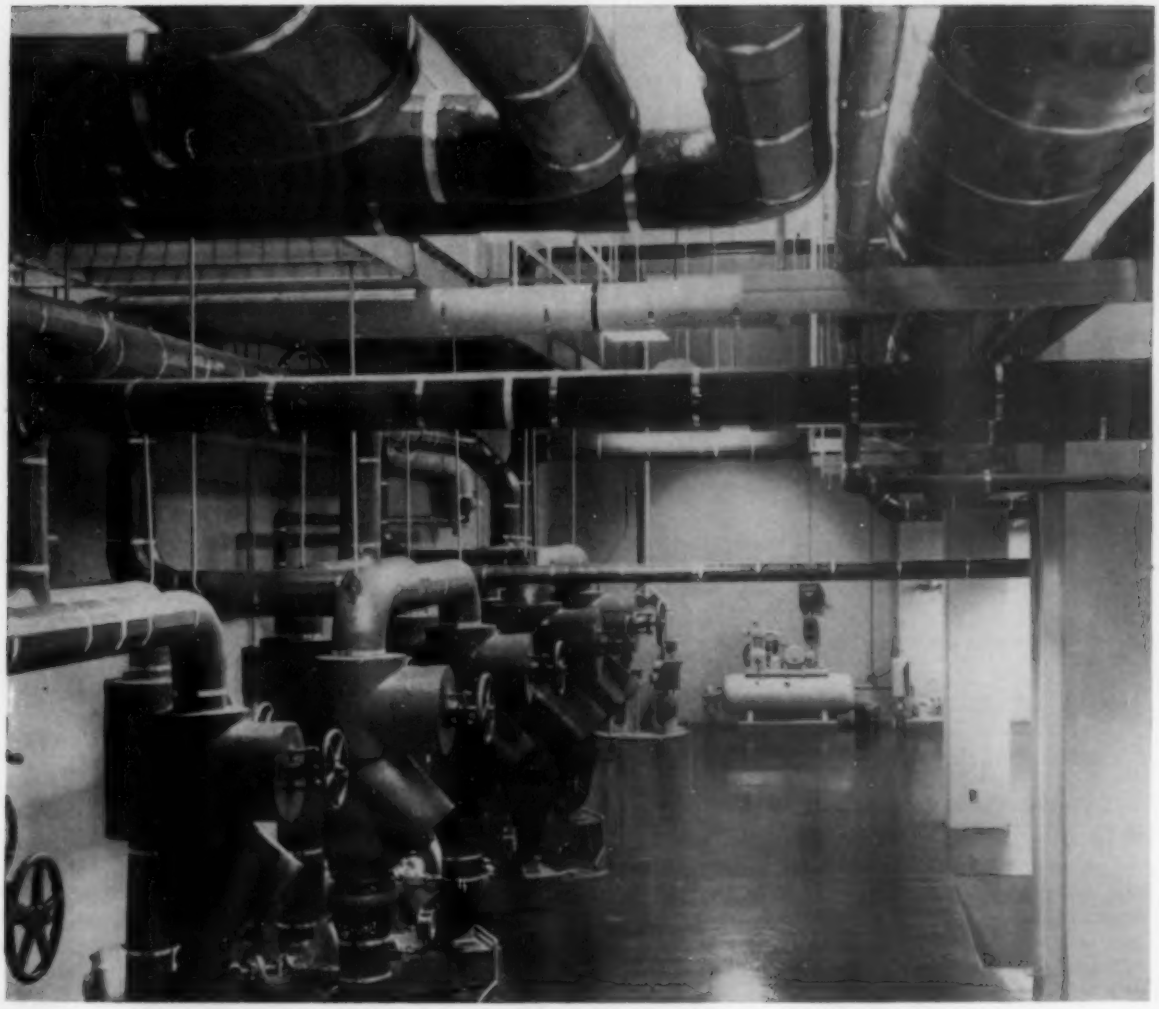
It is the sort of thing that can be done successfully by any willing group or individual, according to Dr. D'Alonzo. He points out in the book that the effort to recognize the disease is a key factor in any attempt to do anything about it, whether by an individual or an organization.

Despite its success, the company still campaigns for the early recognition of symptoms of alcoholism, as the earlier it is recognized in a man or woman, the easier it can be treated. This and treatment of it as a disease are vital, according to the book.

Dr. D'Alonzo writes that the alcoholic must want help before the help will do any good; he cannot be forced into it. All too often that does not occur until he hits rock bottom. How he gets there, the stages he goes through, what to look for, and how he can be helped when ready, are all detailed in the book.

It ranges from social drinking to the tragic-comic detail of the alcoholic's almost frantic search for places to hide his liquor supply, through the corrosion of "the shakes" to the struggle for sobriety. The simple, undramatic language of the book — even the parts which are semi-medical — makes the struggle of the man vivid.

It describes the alcoholic and the phases of the disease because recognition is vital. It relates how the disease affects the individual, medically and otherwise, and how those around him are affected. Most importantly, it covers medical and non-medical treatments and shows how they can be made to succeed and it details the role of industry and family in meeting the problem.



Sure it's neat—but how can you tell it's safe?

The product tells you it's safe—USS National Seamless Steel Pipe and Tubes. The designer who insists on USS National Seamless is taking no chances. He wants to safeguard life and equipment, and to stop shutdowns because of unexpected failures.

Seamless shuts out all doubt. From end to end, it's one continuous piece of highest quality steel. No welds. No weaknesses. Absolute uniform wall strength. What's more, when a solid billet of steel is pierced, it's also critically explored. If the billet is successfully pierced, then every inch of the pipe is structurally sound.

Little wonder, then, that for industrial uses involving particularly severe or hazardous service, the first choice of engineers is seamless—in many cases, the use of seamless pipe is mandatory.

Remember this! USS National Seamless has ample ductility to permit bending, coiling and all other manipulations. USS National Seamless is not only the safest, but also the easiest to work with.

National Tube manufactures seamless pipe and tubes in a complete range of steel analyses from low carbon through the alloys up to and including stainless steel, to withstand the highest pressures and temperatures. A wide variety of sizes and wall thicknesses is available. Plan now to contact National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS and National are registered trademarks

The world's largest and most experienced manufacturer of tubular products

National Tube Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York United States Steel Supply Division, Chicago

TIMELY COMMENTS

Some Engineers Need A Limit Switch

IN THIS DAY of intense specialization engineers are continually faced with the problem of evaluating their own capabilities with regard to solution of specific problems. Determining how far to go on his own power and when to call on specialists is not easy.

The engineer responsible for general engineering and maintenance in industrial operations is under continuous pressure because of new developments and new concepts. Life is too short for him to learn everything he seems to need in everyday practice of his trade.

The conservative sticks only to methods that he knows and understands, and the adventurer goes helter skelter into fields that he does not understand. Both are failures at their jobs. The first deprives his company of advancement and the second is continually getting in trouble by failure to investigate thoroughly.

So whether he likes it or not, the plant engineer is heavily dependent upon the sales engineers that serve him. Their services are the only services that come cheap enough for him to afford — except in unusual instances where hiring a consultant is justified.

Why is the sales engineer's service so cheap? He certainly doesn't work cheap. In fact, the average top quality sales engineer draws more monthly pay than the plant engineer who buys his products.

The reason the sales engineer can offer so much for so little is the system under which he operates. His whole company is set-up to know and learn things about his product. Field experience is continually fed back to the factory and every manufacturer worth his salt has a good research organization. Equipment manufacturers quickly learn about failures and they are quick to exploit successes.

So, in the long run, the sales engineer is one of the best sources of information and in the vast majority of cases he can be expected to give honest help to his customers insofar as his own products are concerned.

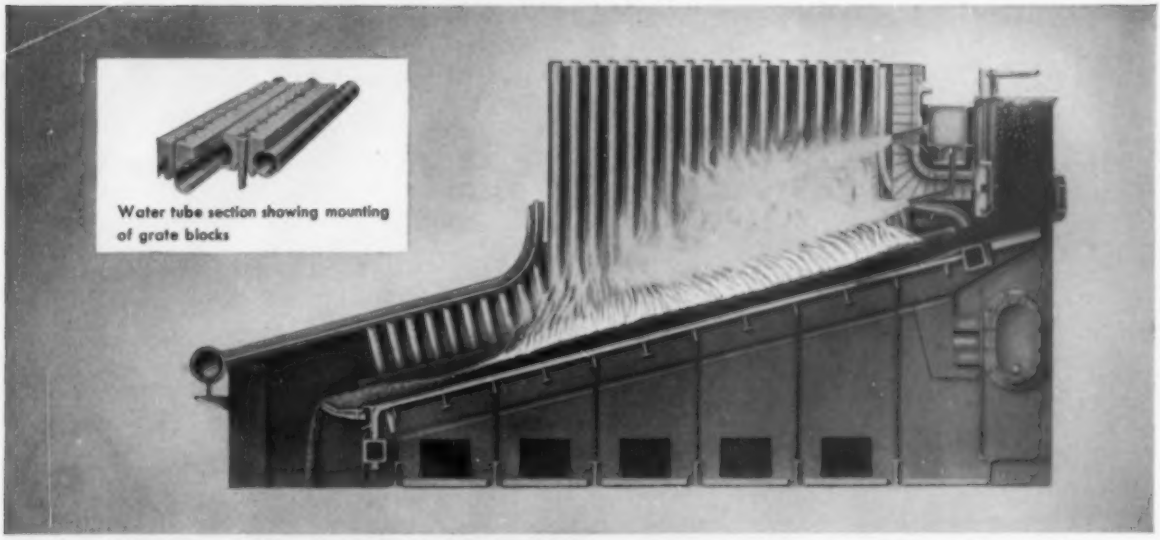
But to keep progressive, the plant engineer needs at least superficial knowledge in many fields. His basic knowledge of engineering, experience and common sense should guide his judgment — and some understanding of new developments can come from reading, attending technical meetings and discussing mutual problems with his fellows.

His guide post should read: "A little knowledge is a dangerous thing." And he must learn when to seek advice from specialists.

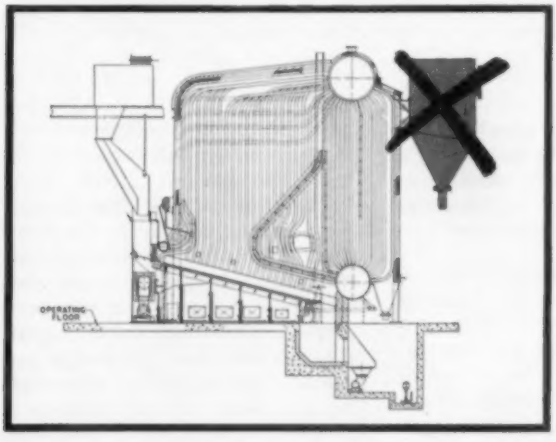
Many plant elements that must be maintained, relocated and adjusted, are complicated and contrary. Correctly applied and properly treated, they live up to expectations. But just a few changes "that won't make any difference," and trouble starts.

To add to the plant engineers difficulties — very few instruction manuals are clear and explicit. Even where the wording is clear, there is a tendency to talk about two or three models in the same instruction sheet and the uninitiated is likely to become puzzled. When you start to turn "knurled screw B at lower right" you sometimes find it is not there and the whole thing has to be studied out. Here again, caution is important and the impulse to "rearrange the crazy thing" should be resisted until a thorough investigation is made.

Only AE Vibra-Grate Stokers give you these 3 important benefits



Water-cooled grates. Water-cooling . . . directly connected to the boiler circulation system . . . guarantees the longest grate life available in any stoker today. Proven maintenance costs are less than one cent per ton of coal. In fact, one major installation has used less than $200.00 worth of repair parts in over four years of continuous operation!



Elimination of dust collectors and cinder return systems. Vibra-Grate burns the coal on the grate . . . dust collection and cinder return systems are not needed. You will never have to be selective in the grade of coal you burn either. Vibra-Grate feeds wet or dry fuel, high or low grade coals. It can burn gas or oil singly or in combination with coal. Overfire air assures complete combustion, giving absolute freedom from smoke at high or low ratings.

Higher efficiency. Intermittent vibrating motion of the grate feeds and moves the fuel . . . insuring even, compact distribution on the bed. A combustion-controlled electric timer determines the vibration frequency as required by fuel and steam demand. There are no light spots or holes to reduce efficiency. The grate supports form air-tight zoned sections dampered to permit accurate regulation of undergrate air.

THE AE VIBRA-GRATE offers advantages in stoker operation and efficiency that have never been available before, because it is the only stoker which combines the maintenance saving features of water-cooling and the high efficiency features of a vibrating grate and controlled zone undergrate air. Only from Vibra-Grate can you get such dramatic reductions in maintenance costs . . . as well as efficiencies that can't be equalled. Write for complete information on what Vibra-Grate stokers can do for you in terms of lower operating costs. American Engineering Company, Dept. S-103, Philadelphia 37, Pa.

AMERICAN ENGINEERING COMPANY
Wheatsheaf Lane and Sepviva Street • Philadelphia 37, Pa.
Canadian Subsidiaries: Affiliated Engineering Corporations, Ltd., Montreal, P. Q., Bawden Industries Ltd., Toronto, Ont.

For more information, use Reply Card—Page 91

PHOTOGRAPHY — A Training Tool

Plant Changes
Procedures
Simplification
Safety Programs

Every training department can readily shoot slides for audio visual presentations, whether for training, indoctrination for trainees, or promotional purposes.

THE MEN who must plan for and manage the South's rapidly-expanding industrial facilities, are concerned primarily with building factories and training people. Photography — in many different shapes, formats and applications — is becoming a key tool in accomplishing this end.

Plant Moved South

One of the growth factors in Southern Industry is the transfer of manufacturing operations out of crowded centers in the North and East into new, modern facilities in the South. The case of the manufacture of piston rings by an Ohio company is fairly typical.

As the company grew and corporate realignment became necessary, the ring production line came under a subsidiary plant's responsibility — some 300 miles from the home plant.

In time, it became a logical but monumental task to move the entire piston ring department — with two production lines employing a staff of more than 250 workers — to the new location. The idea was to accomplish this relocation:

1) With no interruptions in production. This would be done by moving one production line first and continuing manufacturing operations with the remaining equipment at the home plant. Then, when the new facility started turning out rings, the home facility could be shut down altogether and the move completed.

2) Without transfer of experienced production workers. The idea was to accomplish this entire shift with the transfer of only one employee — the department supervisor. All production workers were to be recruited and trained at the new location.

The problem was that the supervisor had to stay at the home plant to keep an eye on continuing production there. This meant that industrial engineers in the new location were responsible for setting up equipment, training personnel and initiating production for a product they had never seen.

Procedure

Credit for the fact that the entire move was carried off without a hitch goes largely to the help provided by photography. Doing their own picture taking, industrial engineers at the home plant:

First, made a detailed photo-

Nothing tells the story more quickly than a movie with a sound track. New magnetic film and projectors permit training people to vary their narration to suit the situation.

graphic record showing how the equipment in the ring department was set up in a production situation. These pictures, of course, supplemented the extensive plant layout boards and engineering diagrams which were also prepared.

Secondly, the industrial engineers at the home plant went through the entire department shooting time-and-motion study movies which detailed every job up and down the production line.

Finally, step-by-step pictures were taken as the equipment was dismantled for shipment.

At the new production plant, then, pictures could be used for step-by-step assembly of equipment and later for the actual training of production employees and the establishing of manufacturing standards.

With today's modern photographic materials, accomplishments like this can be a routine part of an industrial engineer's job. For example, all of the hundreds of still pictures and the thousands of feet of movies needed to document the piston ring move were done with equipment which engineers could take with them without impairing their normal job functions. By using high-speed Kodak Tri-X Film for this work, they were able to shoot both stills and movies under normal factory lighting conditions.

Work Simplification

Similar movie techniques offer a good tool for management people connected with production training or work simplification programs which are a virtual necessity in today's modern factory.

An important basis of an effective time study or work simplication program, of course, is that the people who are actually working on the production line participate actively in finding better, less tiresome ways to do their own jobs.

There is an outstanding example of how simple, "on-the-job" movies can help a work simplification program at the factory of Her Majesty, Inc., in Mauldin, South Carolina. Her Majesty is one of the nation's leading manufacturers of children's and ladies' undergarments.

All employees at this plant get special indoctrination and training in the purposes and techniques of work simplification from the program's supervisor, Jim Kohn. In classes, which meet on company time, employees are shown "before and after" movies which illustrate how constructive work simplification thinking can make their jobs easier and more productive. In lecture sessions, Kohn shows all employees how to block out simple flow charts for planning of work simplification ideas.

When a bottleneck occurs in the plant, the employees in the affect-

ed department are called on to help work out a necessary solution themselves. Where detailed study of a working situation is called for, Mr. Kohn takes his easily operated and relatively inexpensive Cine-Kodak camera into the plant and shoots enough footage to cover the working situation fully.

If high-speed equipment is involved, movies are made in slow motion for more detailed study. To maintain the natural effect, Mr. Kohn works with fast film under normal factory lights.

In this way, the work simplication study becomes an activity in which the individual worker participates. When the work study movie is "premiered," they are the stars. They are able to mix the fun of watching movies of their friends and neighbors with the search for a better way of doing their jobs.

Movies are a particularly good work simplification study tool because they make it possible effectively to isolate a manufacturing operation. Studying an operation in the plant, there is no way to be sure that all members of a study team are observing exactly the same phases of an operation. Also, in the plant itself, there are inevitable distractions.

But, with movies to pinpoint the operation and remove it to the secluded surroundings of darkened room and projection screen, more effective concentration and study are possible.

Movies, then, play a dual role of helping to encourage employee participation in a work simplification program and also of providing a vehicle for research studies on detailed operations.

Safety

In another phase of employee training, it is the continuing concern of industrial managers to keep a safety education program functioning smoothly. The big trick in safety training, of course, is simply to expose workers to the effective educational materials which are available. Movies have been one of the standard tools of safety education for some time. The big problem, usually, is to bring the people to where they can see the movies.

One company in the hectic oil business of the Southwest has solved its safety education problem by bringing their movies to the workers. A Tulsa, Oklahoma, oil-drilling firm was able to cut its insurance premiums a full $15,000 a year as a direct result of an improved safety education program.

The key feature of the stepped up safety education at this company was taking the movies to the workers. The safety directors for this firm, which has operations scattered in 80 different locations, bought a portable sound projector and packed it into the trunk of his car. As he made rounds of the company's far-flung locations, he gathered groups together wherever he could find them and held impromptu classes in safety.

The safety director started this program at a time when safety

Every training department needs movies to round out a program that accomplishes the job quickly. Many companies are now making their own training films with a minimum of equipment.

Training workers in manufacturing practices find audio visual aids a big help in getting the point across quickly. Key slides in the presentation may also be used with table viewers throughout the plant.

education was of major concern to his firm. The company had experienced a run of accidents which threatened a cancellation of their insurance policies.

Within a matter of months, the safety director was able to mount a full-scale accident prevention offensive, carrying his program to every supply house and oil well drilling job between the Rockies and the mouth of the Mississippi. Not only was the threat of insurance cancellation withdrawn, but premiums were eventually reduced $15,000 per year.

Of course, your company does not have to be spread out like the oil-well company operation for an aggressive safety education program to pay worthwhile dividends. Safety classes can be convened with greater ease and more regularity in an in-plant situation. The Tulsa firm's case merely offers a graphic example that industrial safety really pays. It is a fairly simple matter for management men anywhere to adapt educational movie programs to their individual needs and derive similar, continuing benefits.

Simple and Effective

What it boils down to is that photography at the non-technical or executive level can be a simple and effective means of improving communications.

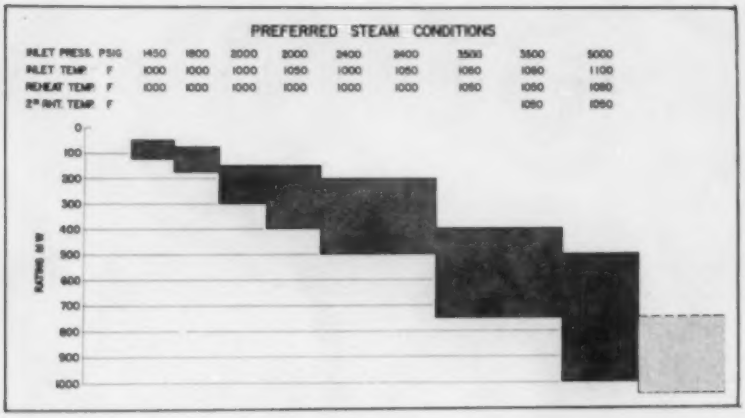
One prominent executive, for example, frequently has a 35mm candid camera hanging over his shoulder as he strolls through his plant or offices. When he sees a situation which is worth discussing with a department head, he simply shoots a picture of it. Using high-speed film, he is able to take his photos in normal factory lighting conditions. Rather than having to go into long verbal explanations, he simply passes pictures around among his executives. Explanations are briefer — time is saved.

Americans are pretty well conditioned today to accept photography as a part of their everyday life. The great majority of the households in our country possess some type of camera. Everyone is exposed to photography. For busy executives, it can pay handsomely to carry forward the "normal" outlook on photography into the conduct of their businesses or jobs. As a general rule of thumb, photographic methods will make things simpler and easier. Almost automatically, then, they will make businesses more profitable.

EDITOR'S NOTE:

The principal manufacturers of cameras and photographic supplies can furnish bulletins on industrial photography and there are specialized magazines dealing with the subject.

Also the manufacturers of photographic equipment are staffed at headquarters to answer specific questions and consult on problems that arise in the industrial field.



Trends in Electric Utility Steam Turbines

By S. D. FULTON
General Engineer, Apparatus Section
Large Turbine Engineering, Steam Division
Westinghouse Electric Corporation

THE AVERAGE rate of increase in initial steam temperature, from 1900 to the present, has been 12 F per year. Extrapolation of these conditions would indicate that steam temperatures will probably not exceed 1200 F until about 1970. This does not appear unreasonable since the first 1150 F turbine has been in operation only a short time, and the first 1200 F turbine is now in the process of erection.

Steam temperature increases are contingent on the development of alloys suitable for higher steam temperatures, suitable for production in the sizes and shapes required, and at costs consistent with the thermal gains to be realized. These requirements present a problem since the returns from each additional 50-deg increment of temperature beyond 1200 F are small.

It now appears probable that for the immediate future any significant improvement in the heat power cycle will come from a combination of the steam and gas turbine cycles. An installation with a gas turbine using the products of combustion from a pressurized coal burning steam generator appears to offer an improvement of at least four per cent over a 3500 psig 1050/1050/1050 F straight steam cycle. With natural gas fuel the improvement would be slightly greater.

Practical considerations dictate the relationship between pressure and temperature, and between pressure and size. There are practical limitations on reheat temperatures because of structural considerations and because of the necessity of preventing excessive superheat at the exhaust under any operating condition.

Up to the present time reheat temperatures have been limited to 1050 F. Figure 1 shows preferred combinations of pressure, temperature and size for reheat turbines for 50 MW and larger.

High pressures for small ratings result in relatively poor turbine internal efficiency and consequently insufficient thermal gains to justify the increased cost. On the other hand, very large ratings with the lower steam pressures result in excessive volumetric flows at the inlet end of the turbine. This requires prohibitive sizes of steam inlet features, namely: throttle valves, steam chests, steam inlet piping from the steam chests to the turbine, and nozzle chambers. The control stage requires excessive blade length and is difficult if not impossible to build.

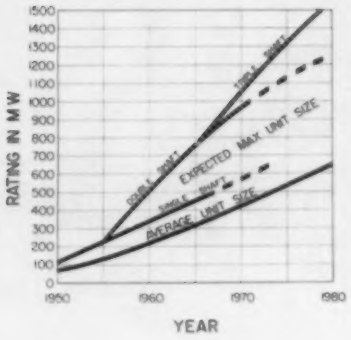
Pressures above critical and very large volumetric flows at subcritical pressures impose design limitations, when partial admission is used to provide good partial load performance, because of the bending forces on the relatively flexible high-pressure rotors. A solution to this problem may be provided by the monotube or once-through steam generator operating with a combination of variable pressure and with partial admission at reduced load.

Rapid growth of electric utility systems and increased interconnections have had a marked effect on the size of turbine generator units. Figure 2 shows an estimate of the maximum and average size units up to the year 1980.

Insofar as the low pressure end of the turbine is concerned, the use of multiple exhausts for both 3600 and 1800 rpm will permit building any foreseeable size required. Blading volumetric flow at the inlet end can be kept to reasonable values by the use of double flow elements or supercritical initial pressures.

Economics usually dictate the use of the largest units which the size of the system or power pool will permit. The benefits obtained

PROJECTED UNIT SIZES



from larger units are:

1. Decreased capital costs per kw installed.
2. Decreased costs for operating labor per kw generated.
3. Lower fuel cost per kwh generated (lower net station heat rates).
4. Probable lower maintenance costs per kwh generated.

Modernization

Remarkable progress has been made in the floor space and weight per kw since the beginning of the century. The floor space required per 1000 kw of rating has decreased from about 195 sq ft to about 15 sq ft for 3600/1800 rpm units and less than 10 sq ft for tandem-compound 3600 rpm units. The weight has decreased from 75 pounds per kw to about 10 pounds per kw for 3600/1800 rpm units and about six pounds per kw for tandem-compound 3600 rpm.

These reductions in size and weight represent very large savings in station costs. *In many cases obsolete units in stations strategically located on valuable sites can be replaced with four times the capacity.* This can represent an enormous saving since suitable power plant sites in metropolitan areas are becoming difficult to acquire or are nonexistent.

Turbine Types

The range of pressures, temperatures, and sizes for today and for the near future requires a large number of turbine arrangements. Figures 3 and 4 illustrate the variety of arrangements required to cover the range of 50 to 1000 MW with steam pressures up to 5000 psig and temperatures up to 1200 degrees F.

The capacity of a specific condensing turbine is a function of the volumetric flow which the last row of rotating blades can pass without incurring excessive exhaust losses. The volumetric flow depends primarily on the capacity of the unit and the vacuum. The specific volume of steam is almost inversely proportional to the absolute pressure so that for the same order of exhaust loss the capacity decreases directly as the exhaust pressure decreases.

With advances in metallurgy and mechanical design, longer blades have been designed. The longer blades allow increased ratings for a given turbine configuration. The most notable increases have been made at 3600 rpm because this speed lends itself more readily to the design of high-pressure, high-temperature elements.

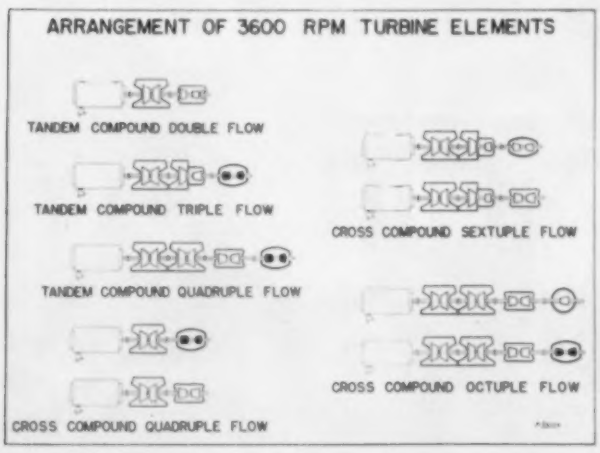
In addition, long 1800 rpm blades result in massive low-pressure castings and rotors which require very large machine tools and manufacturing facilities. They are difficult to ship, erect, and service. In fact, low-pressure turbine rotors with blades longer than 40 inches must be shipped with the lowest pressure stages unbladed.

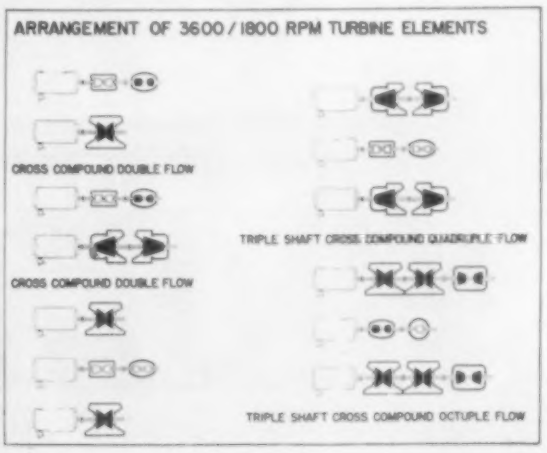
For equivalent exhaust annulus areas, the arrangement with the least number of exhaust ends will have the lower cost. In general, for equivalent exhaust annulus areas, a 3600/3600 rpm cross-compound arrangement will have a lower cost than a 3600/1800 rpm arrangement. Turbine designs currently available permit building single shaft 3600 rpm turbines up to 500 MW and cross compound, 3600/3600 rpm, up to 800 MW.

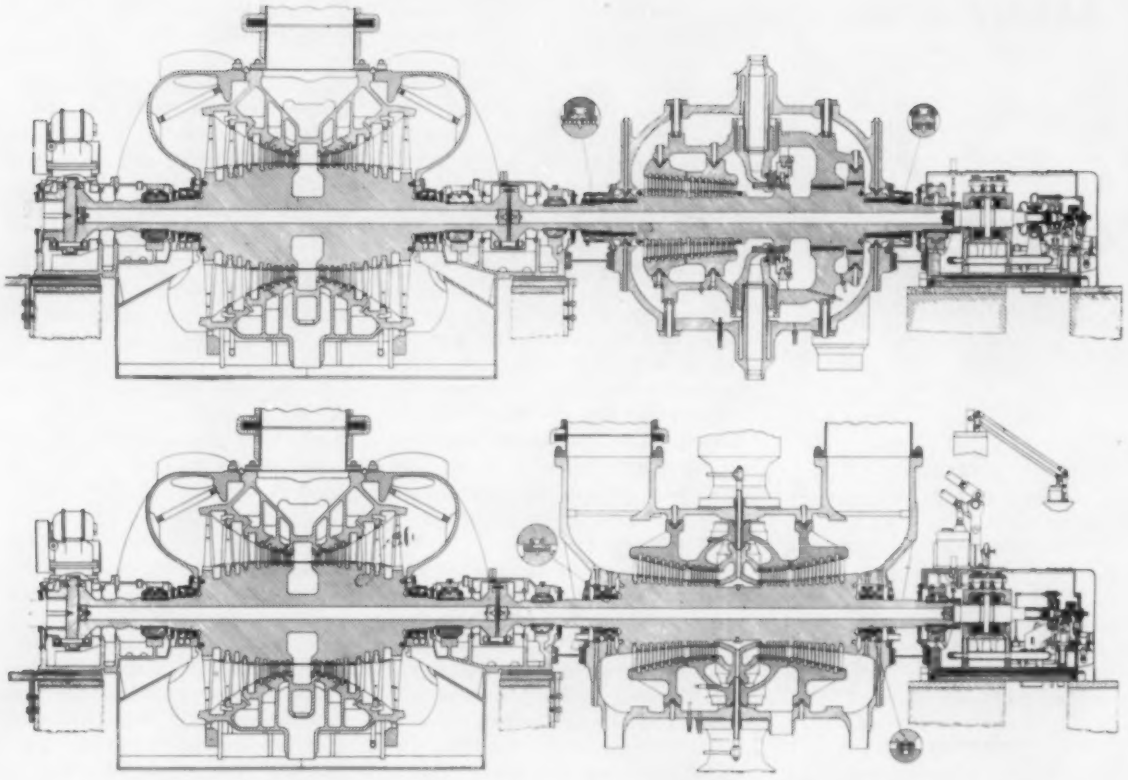
The development in thermal cycles in the past 15 years, increases in pressure and temperature, and the use of reheating have necessitated radical changes in design concepts to meet the more severe operating conditions and to provide the degree of reliability and operating flexibility which the electric utility industry has had in the past.

Pressure increases have necessitated heavier walled pressure containers while temperature increases have reduced permissible stress levels.

Improved alloys have partially compensated for reduced allowable stress levels, but the net result has been to increase wall thickness more than would be required to compensate for pressure increases alone. Thicker wall-


ARRANGEMENT OF 3600 RPM TURBINE ELEMENTS
TANDEM COMPOUND DOUBLE FLOW
TANDEM COMPOUND TRIPLE FLOW
TANDEM COMPOUND QUADRUPLE FLOW
CROSS COMPOUND QUADRUPLE FLOW
CROSS COMPOUND SEXTUPLE FLOW
CROSS COMPOUND OCTUPLE FLOW


ARRANGEMENT OF 3600/1800 RPM TURBINE ELEMENTS
CROSS COMPOUND DOUBLE FLOW
CROSS COMPOUND DOUBLE FLOW
TRIPLE SHAFT CROSS COMPOUND QUADRUPLE FLOW
TRIPLE SHAFT CROSS COMPOUND OCTUPLE FLOW



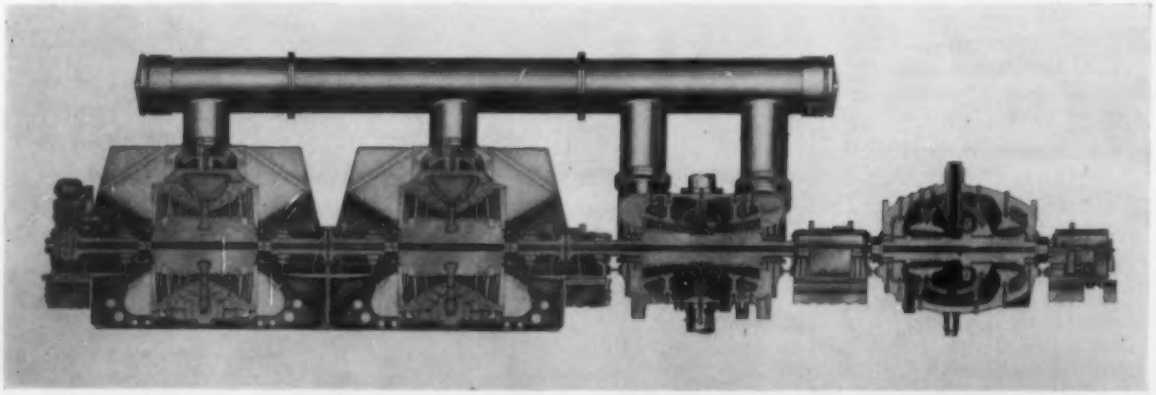
This unit ordered by Alabama Power Company for its Barry plant is a cross compound, 225,-000 MW, 3600/3600 rpm reheat turbine designed for 2000 psi, 1000/1000 F, 2" Hg.

ed pressure vessels result in greater masses of metal to heat and cool, greater temperature gradients and more severe transient thermal stresses.

To meet these conditions, designs have been developed with high - temperature, high - pressure containing parts of the smallest size and simplest shapes consistent with the service to be performed. Steam cooling of high temperature parts, introduced more than a decade ago, provides a means of reducing average temperature levels and transient thermal stresses due to thermal cycling.

Figure 5 is a longitudinal section of a 325 MW single shaft 3600 rpm reheat turbine designed for 2000 psig, 1000/1000 F, 1½ in. Hg absolute exhaust pressure. This unit is being built for Arkansas Power and Light Company. Figure 6 is a longitudinal section of a 225 MW cross compound 3600/3600 rpm reheat turbine designed for 2000 psig, 1000/1000 F, 2 in. Hg absolute exhaust pressure ordered by Alabama Power Company for their

This single shaft reheat turbine is being built for Arkansas Power and Light Company — Tandum compound, 3600 rpm, 325 MW, 2000 psig, 1000/1000 F.



Barry Station.

These units illustrate two different approaches to large 3600 rpm turbine generator units. Both units incorporate many design features which have been proved essential for trouble-free service under the severe operating conditions encountered on most utility systems today. Notable among these features are:

(a) Twin throttle valves.

(b) Twin steam chests.

(c) Double casing design with separate nozzle chambers at both initial and reheat steam inlets.

(d) Steam cooling of high temperature parts.

(e) High temperature rotors balanced in three planes and tested for thermal stability in a heater box at maximum operating temperature.

(f) Low pressure blade ring separate from the low pressure casing.

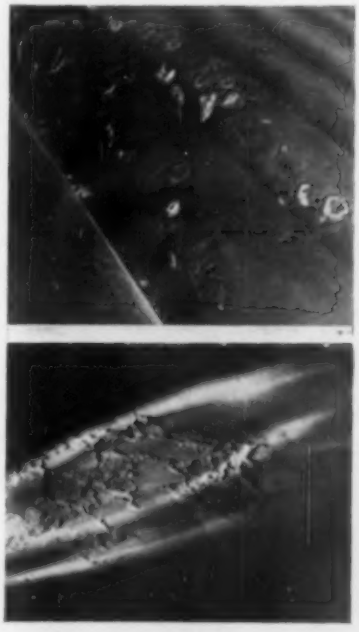
Cross-compound turbine generators of 3600/3600 rpm with the low pressure ends evenly divided between the two shafts have received wide acceptance in the electric utility industry for large units. It appears certain that their use will increase as more units are required beyond the capacity of 3600 rpm single shaft units. There are many advantages over 3600/-1800 rpm units, one of which is unique. Since there are two shafts operating at 3600 rpm, it is possible to use two half capacity boiler feed pumps, one driven from each of the main generator shafts.

Turbine generator designs are now available from domestic manufacturers to meet both current and prospective needs of the Electric Utility Industry both as to size and steam conditions. The configurations available for a given rating permit selection to suit a wide variety of physical and operating conditions.

Salt Damage to Boiler Metal

WATER SOFTENERS for use in softening boiler feedwater make-up have long been accepted as useful or necessary in the efficient operation of many boiler plants. All of us are aware of the water softening process from the standpoint of ion exchange for boiler feedwater. However, a softener not properly watched during regeneration can cause excessive damage to the boiler metal in the form of chloride pitting if the salt used for regeneration is carried into the boiler itself.

Recently, while chemically cleaning two 300 hp HRT boilers in Greeneville, Tennessee, to remove heavy scale deposits on the heat exchange surfaces, prominent evidence of chloride damage of this type was found in one of the two boilers. The upper photograph shows this extensive damage on a few of the top tubes immediately to the rear of the feedwater inlet and top manhead opening on one of the HRT boilers. Some of the pitted areas still have some scale imbedded in the pitted structure of the metal. Where no scale shows, evidence of the chloride pitting is easily distinguished from



that of the clean bare metal.

No chloride pitting or damage was noted on the tubes toward the front of the boiler. Nor was any pitting noted on the bottom tubes.

The lower picture was taken with some difficulty inasmuch as flash bulbs completely destroyed the picture due to reflected light from the clean metal.

Both pictures show the excessive damage done by the salt.

The second boiler adjacent to this boiler was also inspected at the same time but no damage from salt was evident in this boiler.

Proper precautions should be taken and set up as a regular established procedure to prevent salt from leaving a water softener and consequently entering any boiler. Several methods are applicable for making this test and the simplest of all is the taste test.

If the water being softened for boiler feedwater make-up is a non-palatable water, then another method should be used. A better method is often desired even with palatable waters and that is the actual chloride test on the water from the water softener, comparing it with the chloride content of the raw water.

By following such an established procedure, a condition such as the one illustrated can be completely eliminated. A simple chloride test even by the drop count method is satisfactory for this particular purpose. A more precise method can, of course, be used, dependent upon the facilities and requirements of each plant's needs or demands for water quality and purity for its boiler operation.

By CLYDE A. FARRIS, JR.
Water Services, Inc.
Knoxville, Tennessee

Florida Engineer Says You Need a Definite Procedure for —

Compiling an Engineering Budget

By **BERT CARSON**

Maintenance Planner, Hudson Pulp & Paper Corporation, Palatka, Florida

THE ENGINEERING Budget is of the utmost importance if we are to:

1. Keep maintenance cost under control.
2. Plan new work expansions, and
3. Establish a standard cost for manufacturing the finished product.

There are several methods for compiling an Engineering Budget. The method described here has proved to be simple and accurate. The Engineering Budget is the sum total of the engineering department's anticipated expenditures for the coming year on three classes of work:

1. Maintenance repairs.
2. Repairs and alterations appropriations, and
3. Capital expenditures appropriations.

MAINTENANCE REPAIRS may be further broken down into the following catagories:

a. Routine upkeep of equipment.
b. Preventive maintenance inspections and adjustments.
c. Oiling and lubrication of equipment, and
d. Shutdown repairs.

REPAIRS AND ALTERATION'S appropriations include such items as replacement of worn out equipment, repairs to equipment that becomes worn in the manufacturing process, relocation of equipment or alterations to equipment which do not appreciably increase its capital asset value.

CAPITAL EXPENDITURE appropriations include new work, expansion and replacement and alterations which will materially increase the capital asset value.

Procedure

Since the information necessary for compiling the *Maintenance Budget* is more readily accessible, it is desirable first to set the wheels in motion for obtaining the necessary information for compiling the appropriation requests for *repairs and alterations*, and *capital expenditures*.

To insure the receipt of the desired information in usable form, I have found it best to run off blanks, outlined in such a manner as to make clear to top management:

1. The type request, i.e., repairs, alterations or new installation.
2. The nature of the request.
3. The savings in time and dolars anticipated.
4. The estimated cost of equipment and supplies.
5. The estimated labor cost for installation.
6. Will the installation cause lost production time?
7. A description of any change in process.
8. The engineers' remarks and recommendations concerning engineering time for making drawings, ordering and receiving equipment, etc.
9. The Plant Engineer's approval of estimated cost and installation time.
10. The Production Manager's approval of change in process.
11. The Plant Manager's approval of the expenditure.

Send these blank appropriation requests to each department superintendent, with a cover letter, specifying the deadline for their return. Upon receipt of these forms properly filled in, the Maintenance Controller should put an identifying number on each, log it in the proper budget work book and forward to the Plant Engineer for estimating.

When the form has been estimated, the engineer making the estimate should fill in the form, specifying estimated cost only. Do not go into complete details until final approvals have been received.

The Plant Engineer should initial the form in the space with the Estimating Engineer to denote his approval of the estimate. He should not sign in the space provided under final approval, until the other approvals have been received and final engineering is completed.

This form should be returned to the Maintenance Controller. Duplicate copies will be made of each request when it reaches this

A Standard Form Something Like This Will Help.

Appropriation Request for Engineering

BUDGET

Date: _____

TYPE REQUEST	NATURE OF REQUEST:
Repair ☐ Alteration ☐ Capital ☐	

ANTICIPATED SAVINGS		ESTIMATED COST	
Increased Production	_____ Tons/Mo.	Equipment	$ _____
Manpower	_____ Manhours/Mo.	Supplies	$ _____
Better Product	☐ Yes ☐ No	Manhours	_____
Will Installation Require Lost Production?	☐ Yes ☐ No	Labor Cost	$ _____
		Total Cost	$ _____
DEPARTMENT SUPT. MAKING REQUEST		ESTIMATING & PLANT ENGINEERS	

DESCRIPTION OF CHANGE IN PROCESS	ENGINEERING REMARKS
	Drawings Complete _____ Equipment Delivery _____ Supplies Delivery _____ Prep. Work May Begin _____ REMARKS:

Will be ready for installation _____ weeks after final approval.

FINAL APPROVALS

PLANT ENGINEER	PRODUCTION MANAGER	PLANT MANAGER

stage. These copies will be filed in the proper budget work book, under the cost center affected.

The original will be forwarded to the General Superintendent for approval. If approval is received from the General Superintendent, the form will be delivered to the Plant Manager for approval. If final approval is received, the form should be returned to the Maintenance Controller, who will complete the duplicate copy and forward the original to the Plant Engineer for final engineering.

If, at any stage, this request is turned down, the reason should be stated by the person rejecting it and the form returned to the Maintenance Controller. The Maintenance Controller will write the reason on the duplicate copy and will remove it from the budget work book and file. The original will be forwarded to the Originating Superintendent for his records.

While the information is being assembled for the two appropriation budgets, the Maintenance Con-

The procedure outlined here was developed for a big plant with many employees. But the same principles apply to smaller plants. In fact planning and scheduling are more likely to be neglected in small organizations and they certainly need a simplified program of this type.

troller may assemble the necessary information and compile the Maintenance Budget request.

The Maintenance Budget

Most of the information necessary for compiling the Maintenance Budget should be obtainable from the Monthly Maintenance Cost Reports for the past year. The following information should be assembled by Maintenance trade and individual cost center:

a. Man-hours worked
b. Dollar value of parts and supplies used

This information should be broken down into the class of work, i.e., Regular Maintenance, Preventive Maintenance, Shutdown Repairs, Painting, Oiling, and Lubrication, etc.

The past year's job records should be searched for big jobs that will not be a repeat during the coming year. These labor hours, and cost of parts and supplies should be removed from the budget forecast at this stage.

The Active Job Records should be searched for work to be done that carries high labor hours and parts and supplies' estimates. These hours and costs should replace those removed from the budget forecast.

Add from .5 to 1 per cent to the labor hours according to the size of the plant and maintenance crew, for anticipated additional maintenance due to the plant being one year older.

Obtain from the Standard Cost Committee the Standard Labor hour rate for the coming year. Transpose all labor hours into dollars, continuing to keep the trades, class work and cost centers separate.

Obtain from the Purchasing Department the average increase or decrease in parts and supplies. Obtain from the Accounting Department the stores overhead and any increase or decrease in freight rates. Add the per cent for the plant being one year older. Consolidate this information into one percentage figure and extend the parts and supplies dollars, again by trade, class work and cost center.

Summarize the budget forecast by Maintenance trade and class work and total. The Maintenance part of the Engineering Budget is then ready to be presented for approval.

At this stage, the Maintenance Controller should review the proposed maintenance budget with the Plant Engineer. The place to present this budget for approval is a meeting set up for this purpose. The budget meeting should include the following:

a. Plant Engineer
b. Plant Manager
c. General Superintendent
d. All departmental Superintendents
e. Plant Controller
f. Standard Cost Supervisor
g. Maintenance Superintendent and
h. Maintenance Controller

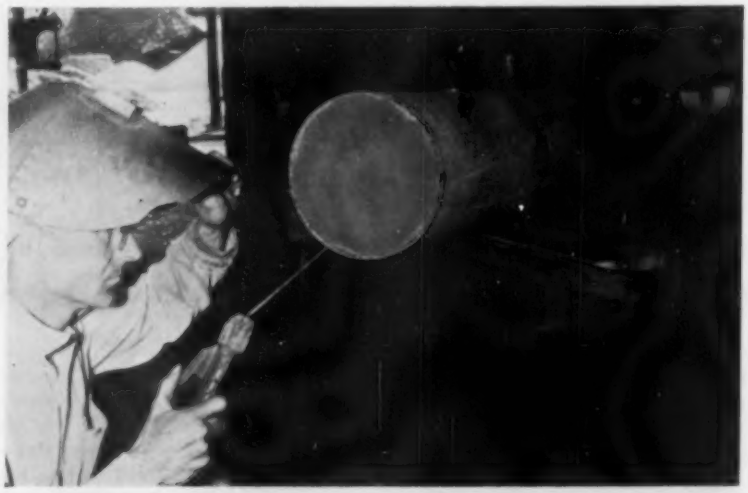
Each supervisor attending the meeting should be furnished a copy of the proposed budget. The budget should be presented by the Maintenance Controller. Upon receipt of final approval, this budget should be set aside and the two appropriation budgets compiled in much the same manner.

After all three budgets have received final approval, a summary should be made and copies of the entire Engineering Budget furnished top management. Each departmental superintendent should be furnished copies of the budget for each cost center which is a part of his responsibility.

Follow Through

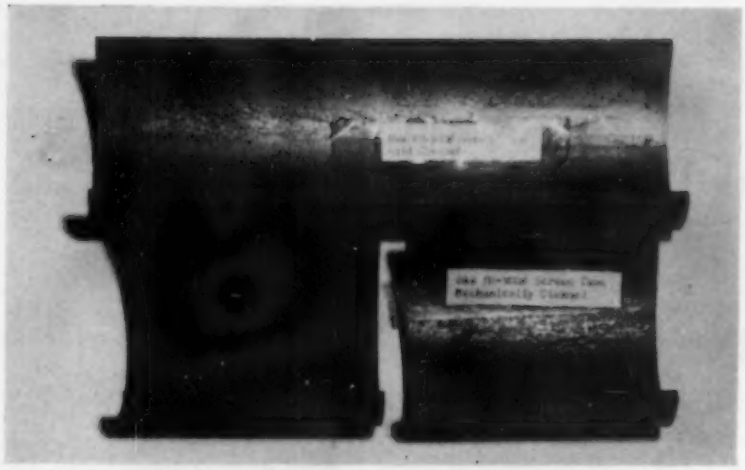
After the budget meeting is over, there is a tendency on the part of most departmental superintendents to lose interest in the budget until the results are reported at the end of the next year.

There are several methods available to the Maintenance Controller to keep enthusiasm high, such as charts and graphs. One method used to good effect was the dividing of the budget for each cost center into monthly totals. Present this monthly total with the first cost report of the year for each cost center. Subtract the monthly cost from this figure. If the department operates under the budget for that month, show a carry over into the next month. If the department goes into the red, show a deficit to be carried over into the next month. The next month subtract the deficit before applying the current costs. This method seems to be more effective and makes for better reporting.



TANKS SALVAGED — We have a variety of steel tanks around the plant that are used for storage of liquids. They rust out quickly on the bottoms, but instead of requisitioning new tanks, we give them another lease on life by burning off a few inches of the bottom and welding in a piece of scrap steel plate.

By S. CLARK, Maintenance Supervisor, U. S. Phosphate Co., Tampa, Florida.



The upper section was acid cleaned, lower left uncleaned and lower right mechanically cleaned.

Inside Check of Boiler Tubes

By A. R. COX
West Texas Utilities Company
Abilene, Texas

A TWO FOOT SECTION was cut from a generating tube in our 900 lb Babcock & Wilcox FH type boiler at the Lake Pauline Station for internal inspection purposes. (Figure 1) This tube section was located about center line height of the lower burners in the first row of superheater screen tubes.

There was no evidence that this type inspection was necessary. However, since the boiler had been in service 7½ years, it was considered desirable to make this type inspection in the high heat transfer area of furnace. Since we do not know of any operating companies that have made this sort of inspection we feel that the results will be of some general interest.

The soft black sludge present was mechanically cleaned from a 9 inch half section of this tube for laboratory analysis. The analysis revealed the following:

LABORATORY ANALYSIS

Ferric Oxide	51 %
Copper Oxide	18 %
Mg. Hydroxyphosphate $Mg(OH)_2$ $(Mg_3PO_4)_2$	6 %
Serpentine	.9%
Metallic Iron Fe	9.5%

OTHER DATA

Scale Thickness — .025 inch
15.6 gr. of scale per ft of length of 3" O.D. Tube
23 gr. of scale per sq ft of surface area
Tube wall thickness thick side .23"
Tube wall thickness thin side .19"
Tube wall design thickness .18"

The deposit composition was about as expected based upon annual drum inspections and occasional analysis of sludge from the drums, except that a hard thin lacquer appearing scale was left in the tube after mechanical cleaning.

A piece of the mechanically cleaned tube was boiled in a stainless steel beaker containing distilled water with sufficient caustic to provide a sodium hydroxide "B" reading of 3 ml with N/30 HCl acid. The silica dissolved amounted to .188 grams per sq ft. Inspection of the tube section after boiling revealed no noticeable difference in the amount of deposit before and after boiling.

The silica scale probably explains why the silica in the boiler comes up to 20 to 30 ppm when the boiler is refilled and brought up to pressure after internal boiler maintenance each year. It is theorized that washing the boiler during overhaul exposes the silica scale to the boiler water and the filling water being low in total dissolved solids permits a high silica solubility.

West Texas Utilities Company 900 lb Boiler Water Control Limits:

"B" Reading*	1 to 3 ML or pH 10.8 to 11.1
Phosphate PO_4 ppm	2-5
Silica ppm SiO_2	3 Max.
Sulfite ppm Na_2SO_3	5 to 10
T.D.S. ppm	500 Max.

*Hydroxide alkalinity with 1/30 N HCl

After the initial start up of this boiler the silica has been above 15 ppm (Babcock & Wilcox's recommended maximum for safe operation without silica deposition) a total of 16 days and operated 53 days with silica between 5 and 15 ppm. These occurrences are after boiler maintenance periods and the boiler is operated at reduced load until the silica is under control.

Although this silica scale has caused us no serious troubles to date, some steps to minimize any further deposition are as follows:

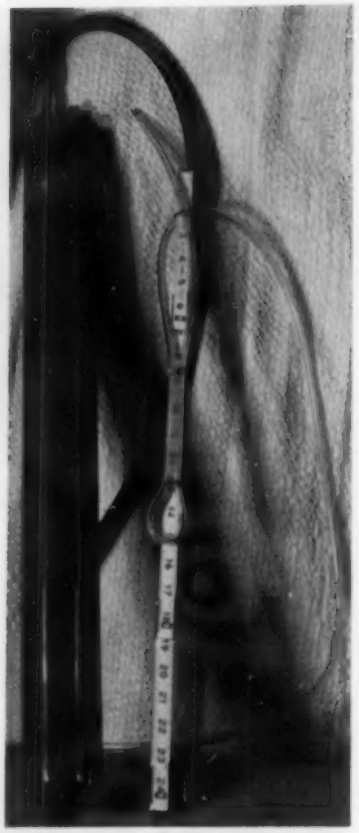
(1) If silica in the boiler water rises above 10 ppm (900 lb boilers) after an overhaul or shut down the boiler will be drained and refilled. But if the silica is less than 10 ppm it will be brought under control as quickly as possible by boiler blow down.

(2) Careful tests for silica on the boiler filling water after overhauls to eliminate the possibility of outside contamination.

(3) Test condensate for silica after admission of steam to unit, upon starting, to determine if any silica is coming from superheater and/or turbine.

FANS Check Points and Testing Equipment

By DAN McCONNELL



A commercial glass-tube manometer, and an emergency apparatus made with a six-foot rule and a piece of plastic tubing. Tubing is held to the rule by rubber bands.

FANS HAVE a widely varied application in industry, but there is one thing that all fans have in common — they handle something that you can't see because it is hidden in pipes and ducts, and you can't measure what they are doing by catching the output in a bucket. So we must visualize their action by observing instruments, and we usually run tests only when a job gives trouble.

We observe not only instruments but many details of the operation that we can feel, see, and hear; and some comments are in order here suggesting that the observer train himself as best he can to see EVERYTHING when he goes on a trouble job that might shed some light on the problem.

The ability to observe — to really SEE what you look at — is more an attitude of mind — guided curiosity — than it is experience, and is well worth giving thought to and sharpening up.

A fan takes in power and puts out pressure and flow of the gas it is handling. A balance struck between speed, pressure, and flow are the three factors that enable us to pick the power demand of the fan from its published characteristic curve or table. There must be modifying factors used to compensate for unusually high or low temperatures, altitude that makes the fan handle a thinner air that the blades cannot get as good a grip on, and maybe material that is being transported in the air stream. These are factors in the design of a job, and on a trouble call you are mainly concerned with why the machine doesn't do what it has been doing, or what it was designed to do.

Speed and Power

A first check point is on speed and power. Is the fan turning as fast as it ought to be? Is the drive worn, slipping, or motor pulley grooves worn to a smaller diameter? A tachometer will tell you. Look good at the grooves on the motor pulley if the unit is V-belt driven and the belts are riding low in the grooves. These grooves can wear and start driving the belt from the inside instead of the sides, and then the pitch diameter is a lot less than you thought it was. If the unit is motor driven, check the motor load with a clip-on ammeter. Has it changed? If it has, better check further to see why.

Pressure

The next check is on the pressure that the fan is putting out. Make this with a manometer — a U-tube filled with water for the usual range of pressures, and with mercury for the high ones.

Two commercial types of manometers are illustrated, and also an emergency job made by looping some clear plastic tubing on the end of a rule and fixing it in place with rubber bands or some sort of clamps.

Take the pressure by drilling a small hole into the side of the duct and placing the end of the tube over the hole. 1/16" holes will usually do all right, and there is scant need for making them larger than ⅛". Drill the hole in the inlet at least three duct diameters away from the fan casing and six to eight diameters downstream of any elbows — the elbows make eddies that will give a false reading on a one-shot basis. If the elbows are too close, drill a hole in each side of the line, read both of them and average the figures.

To prove something to yourself, put a couple holes in a duct just

downstream of an ell, one on the inside of the bend and the other on the outside. Read both holes and you will see how air skids around a turn.

Take the pressure on the inlet of the fan — remember that suction is pressure too — its just minus pressure; and then take it the same way on the outlet. The total pressure across the fan is the sum of the suck and the blow. 2" suck and 2" blow are a total pressure of 4".

Most fan systems do not indicate a steady pressure because there are a lot of eddies in the air that make the manometer column vary. The best bet is to average out the readings by eye.

Sometimes the amount and frequency of the swings will tell you something — there may be a damper or other part of the system in the air stream that has come loose and is swinging in a way to upset the flow. Listen for the fan to "change tune" with the pressure swings too — this may help you to spot something wrong.

Rating Curves

At about this place in the checking you need a manufacturer's bulletin or rating curve on the fan. The three most easily measured elements of the fan characteristic are the speed, power, and pressure, and with these three factors known you can go to the rating data and read off the flow through the fan, assuming that the fan wheel is in good condition, and has not thrown some blades or developed a buildup of dirt or stock on the wheel.

If what you see in the factors so far does not explain the trouble, go over the system measuring pressures, and look for any sudden change in a section of duct.

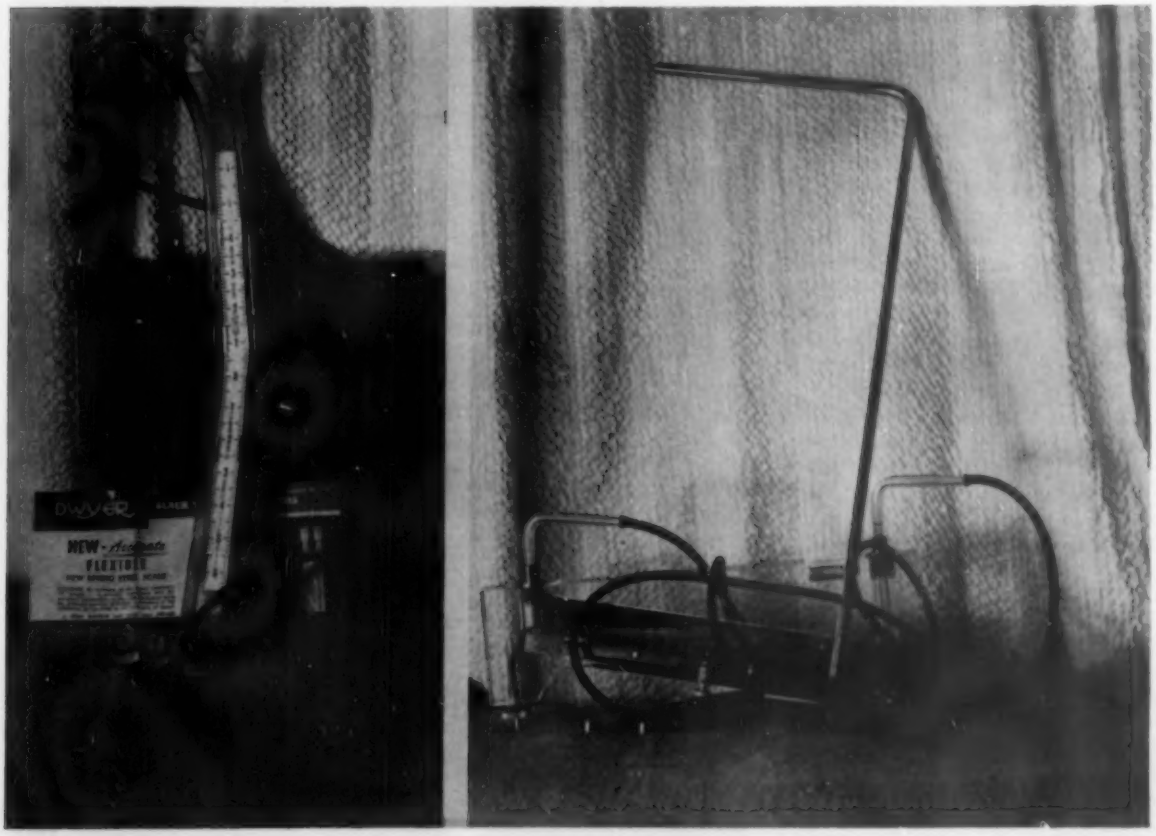
Velocity

It may become necessary to measure the velocity of the gas stream to check the job out completely, and for this work a commercially made Pitot tube assembly with a low-range manometer is the best bet since these units will operate in dust or stock that would cripple any of the types of gages that pass air through the insides of the instrument.

A good commercial unit is pictured, and if the range of the

A commercial manometer (left) made of special plastic tubing and a spring steel scale. This unit bends to pack in the case shown and will handle water, oil, or mercury.

A commercial Pitot tube and low-range manometer unit are shown at right. If the manometer range is exceeded, the longer U-tube manometer can be used with the Pitot tube. Calibration curves are furnished with the device, so velocity can be read directly from the curves in terms of the manometer pressure difference.



equipment is exceeded by a high velocity stream, use a longer manometer in place of the low-range unit, and if the velocity is too high for a water fill, go to mercury. A table of conversion factors for various fluids is at the end of the article, or can be taken from any good handbook.

Balance

Since fans are usually rather high speed rotating machines, an out-of-balance wheel or one mounted on a crooked shaft can give a lot of trouble. It usually shows up as a shake in the building, and sometimes as noise in the ductwork, and can always cause trouble with the fan bearings in time.

Fan balance can often be improved by merely balancing the unit statically in its own bearings. Take off the belts, spin the wheel several times to locate the heavy spot, and either add weight to the light side or take some off the heavy side. Keep trying until the wheel will "die" anywhere.

Loose fits between the wheel hub and the shaft will give an apparent unbalance, and this condition can often be spotted by a hammering sort of thump that repeats at a speed in step with the speed of rotation.

Dynamic balancing the wheel is the best best. You know what balancing the wheels of your car will do for it, and a fan wheel is almost always heavier and faster than an auto tire and wheel. In a push a truck wheel balancer can be used to mount a small fan wheel, or a set of portable balancing equipment can be "faked up" out of some of the newer types of electronic auto wheel balancers.

When you are adding weight be sure to do it in a place on the fan wheel that is out of the path of the air stream, so the flow pattern through the blades will not be disturbed.

Records

In all of this work it is important to know how the system has been operating before it got into trouble, and to give a basis to reason from, it is vital to have a set of test data records somewhere that was made while the system was working right. All that would be needed are the rough field notes on fan speed and pressures, and a few pressures from chosen points on the system. Always note the location of the test holes, or mark them someway so you can find them next time. The best deal is to note and mark, since painters can come by and obliterate marks and stop up the small test holes.

Fan manufacturers are most cooperative in spending bulletins or data requested for particular fans, and it helps in talking to their representatives to be able to show them some pressure and other data to describe the operation.

FOR CONVERSION OF PRESSURES:

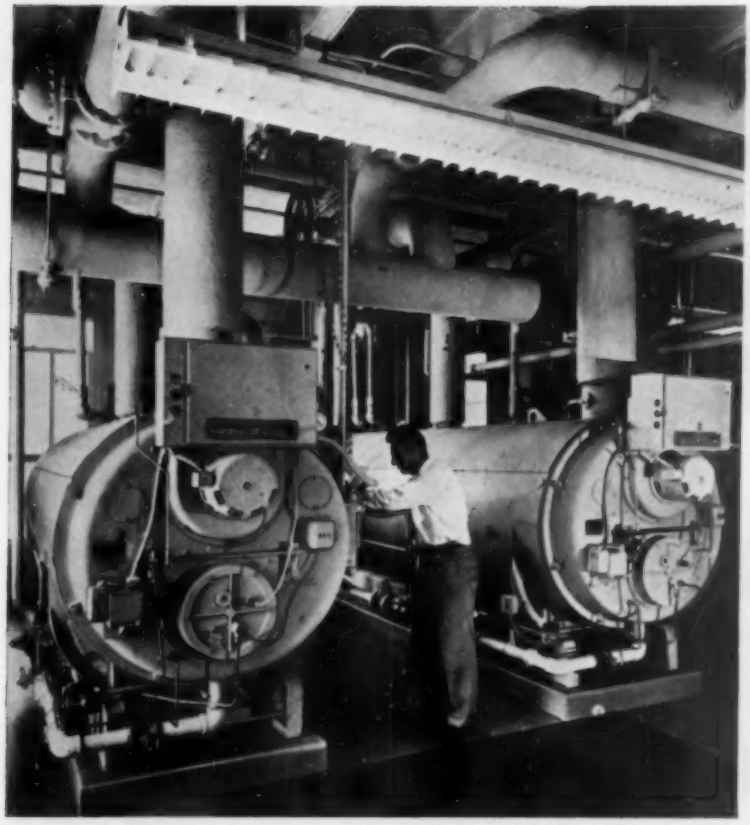
1" mercury equals 13.6" water. 1" water equals 1.25" kerosene. Reading with tube filled with kerosene, multiply by .8 to get inches of water.

Reading with tube filled with mercury, multiply by 13.6 to get inches of water.

The addition of a small amount of any dark dye will make the column easier to read.

Maintenance Welding

A WOOD BOX, provided with wheels, handles and lock, makes a serviceable, portable outfit for oxygen-acetylene welding jobs around the plant. Tips, torches, etc., are mounted on the door.



Texas Boilers Occupy High Position at Low Cost

By A. E. EMMETT
Lone Star Gas Company
Fort Worth, Texas

CONCURRENT with the remodeling and expansion of our main office building from its former five stories to its present eight stories, it became apparent that our existing steam generating facilities were inadequate to supply the volume of steam that would be required for the absorption refrigeration equipment we wanted to install.

Therefore, the existing facilities consisting of a 20 hp cast iron boiler of 15 pound design, and a 50 hp steel standby boiler, both of which had formerly occupied about 2,500 square feet in the basement, along with natural gas-powered reciprocating compressor-driven refrigeration equipment, were removed.

Hedrick & Stanley, architects and engineers, of Fort Worth, Texas, drew up a design for a penthouse boiler and machinery room to be mounted on top of the newly added seventh story.

Their specifications called for this room to hold two 100 hp gas-fired boilers, and absorption air conditioning equipment of 236 tons capacity, plus air handlers for the auditorium and cafeteria, and exhaust equipment for the entire building . . . all to be contained within a 50′ x 50′ area. Hedrick & Stanley specified two 100 hp Cleaver - Brooks boilers which weighed only 10,000 pounds each, complete. Design features included compact physical size, forced draft, and low noise level. The most important of these design features was economy of space and weight, because structural costs climb rapidly with increases in weight supported and space occupied at eighth-story levels.

So compact are the new boilers, that we have almost five times the steam capacity in our eighth floor penthouse that we had in an equivalent amount of basement area.

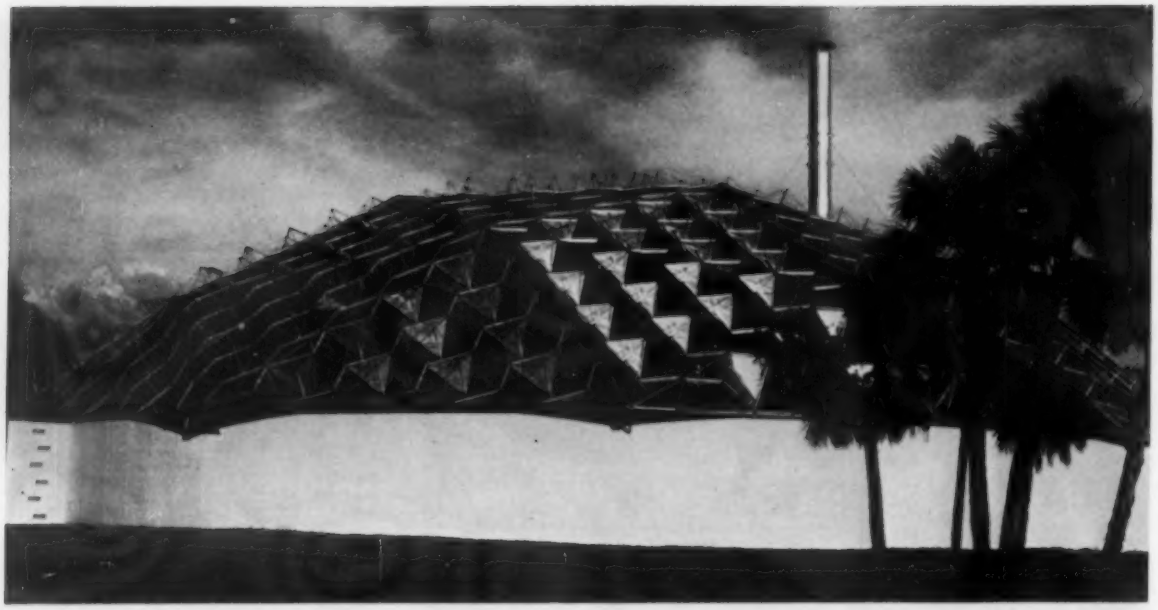
Our choice of 100 hp boilers was dictated not by our heating requirements, for which 30 hp would have been adequate, but by our choice of a 236-ton carrier absorption air conditioning unit, which uses approximately 20 pounds of steam per ton-hour of operation.

Translated into day - by - day figures, this meant that we would need a maximum available steam capacity of approximately 125 to 130 hp, so our total capacity of 200 hp is well above present requirements, and allows ample margin for further expansion of the building to ten stories and penthouse, its design limit.

Since the new boilers operate at a guaranteed minimum efficiency of 80%, whereas the best we could attain with our former equipment was approximately 70%, our operating costs have been reduced about 10% per unit of steam output.

These boilers perform more functions than some far more complex systems, but in a simpler fashion. In the event of trouble, two screws are loosened and the entire programming control can then be removed and quickly replaced with another—causing only a momentary interruption in the boiler's operation. This is in contrast to a situation where a boiler might have to remain shut down until an electronic specialist could be brought on the job, and make needed repairs.

Although original purchase prices of package-type boilers run about the same as for built-up units of comparable capacity, we saved on installation costs because the Cleaver-Brooks boilers are delivered already factory assembled and need only be set in place, and steam, water, fuel and electric lines connected.



This geodesic dome with the science-fiction look spans the new sewage plant at Sarasota, Florida.

A Roof That Breathes and Leaks Reduced Law Suits for Sarasota

WHEN IRATE Sarasota citizens en masse protested against the noxious odors from the Florida city's new sewage treatment plant, engineers (Smith & Gillispie, Jacksonville, Fla.) came up with plans for a geodesic dome and Dacron seal, to form a cover over the trickling filter that effectively solved the odorous problem.

The dome plus its seal, traps the gases and prevents them from escaping into the atmosphere at a low altitude, and with the aid of a blower, shunts them out of a 75-foot stack having a 4-foot opening. Cost of the installation was $35,000, about half the figure another bidder submitted.

The Sarasota plant's filter is a slag pit 110 feet in diameter over which the liquid part of the sewage is poured in the second sedimentation step that permits bacteria on the slag to purify it. It was the operation of the bacteria that created the smelly gases which sent tourists scurrying from local motels.

"The close proximity of the plant to a nice residential area had been resulting in a spiralling number of law suits against the city, and we had from 9 to 10 cases at a time listed on court dockets," said Dean Robinson, administrative official in Sarasota's Engineering Department. "We couldn't afford to abandon the plant since it was comparatively new, and we couldn't afford the continuing legal hassles either.

"Trouble was, at a point only 10 feet high, we had a 110-foot diameter area above the trickling filter spewing the gases over the neighborhood. In our heavily moisture laden atmosphere, the gases couldn't rise fast enough to get above the nostrils of the residents around the plant.

"We felt if we could concentrate the gas at a low area, then let it escape at a high altitude, we could lick the problem."

As a consequence, a stack 75 feet high was constructed, with ductwork leading to it from the trickling filter. A blower of 25,000 cfm capacity was installed in the ducting. "The blower actually isn't required to run continuously, but we operate it around the clock in order to stifle complaints," said Robinson.

Since the rotor, standing 12 feet high, was in the center of the building splashing the liquid sewage over the slag, it was impossible to erect any central supports to hold a roof. That is why the only practical structure was one that could be supported from the building's perimeter.

With the aid of the consulting engineers, and Jeffery Lindsay, a solution was reached. Lindsay, one of the few students of Buckminster

Fuller who taught geodesic theory at San Francisco's Institute of Design, came from California and erected the space-frame dome. Suspended from the dome is the vast expanse of Dacron which fits tightly to the circular wall of the building and seals off the gases.

The rising gas cannot escape through the Dacron, yet the flexible Dacron permits breathing of air into the building between the Dacron and the roof. At the same time, the Dacron bars entrance of rainwater through openings in the roof. Rain would dilute the chemicals used in sewage digestion.

"Originally we had a burner in the bottom of the stack base, but we have no need to use it," said Mr. Robinson. Actually, while the gas is free to discharge from the stack 75 ft in the air, blower velocity raises it another 20 feet, which means the gas has little chance to spread out near the ground.

The hydrogen sulphide gas has a tendency to oxidize the aluminum in the building. Such oxidation is left alone and not scrubbed off, since it acts as a valuable and permanent protection. It detracts little from the appearance of the aluminum. Unlike rust on iron, it serves as a protective coating.

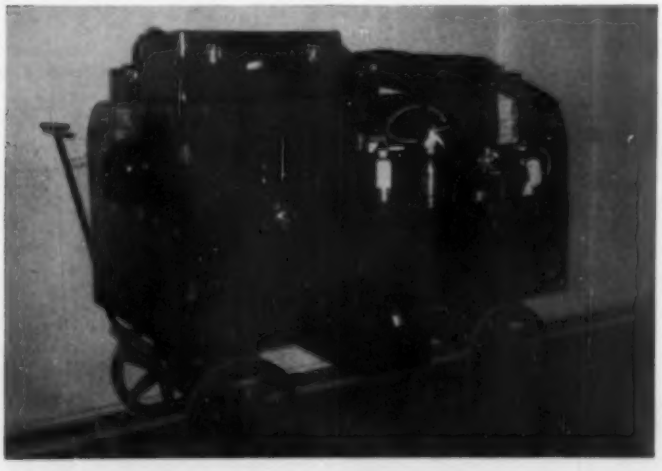
The 12,000 square-foot Dacron seal is held from 157 suspension points by steel cable, to prevent any pockets in the Dacron bag from holding water.

Selection of Dacron as a seal was also based on the fact it can support a great weight of rainwater without damage. Prevented from escaping into the atmosphere by Dacron, gases are forced by the blower down through the granite rock filter for dispersal through the stack.

The aluminum panels are not sealed to make a water tight joint. Spacing between them permit air to circulate in the building above the Dacron seal so it can breathe. Otherwise, a fall of 2 or 3 inches of atmospheric pressure would present an explosion hazard to a sealed building

Fire Prevention in Virginia Plant

AN OUNCE of prevention is worth a pound of cure, goes the old adage. And that's the way we feel about our plant fire protection. Regardless of the size of your plant you can and should own your own fire fighting equipment. We consider it an investment — not an expense. In one year alone, we have saved many thousands of dollars in machinery, equipment and production materials — not to mention the possible irreplaceable loss of lives — by having our own mobile fire fighting equipment.



Employee volunteers were given the necessary training, at company expense, to handle the various pieces of equipment contained in the "fire-wagon." This training pays off continually. Damage by fire is eliminated before it has a chance to start.

Maintenance checks are performed on the equipment in the wagon periodically and new equipment when needed — a small price to pay for a large return.

By H. E. MUNGAN, Manager-Plant Facilities, General Electric Co., Lynchburg, Virginia.

Centrifugal Pump Clinic

QUESTIONS & ANSWERS — Conducted for SPI readers by **Igor J. Karassik**, consulting engineer and manager of planning and **W. C. Krutzsch**, assistant Chief Engineer of the Harrison Division, Worthington Corporation.

1—Cut Impeller Diameter
2—Screw Type Coupling
3—Extra Deep Stuffing Boxes

QUESTION 1 — Cut Impeller Diameter

WE HAVE a two-stage centrifugal pump which we intend applying in another location and on a different service. The requirements of head and capacity are lower than the original pump rating, and we plan to cut the impeller diameter. Should the cut be made on both impellers equally or can a bigger cut-down be made on one impeller only?

ANSWER:

THIS DEPENDS in part on the particular two stage pump in question, and in some cases on the type of service for which the pump is used. Considering these factors, our answer to this question could be any of the three following:

1. Impellers must be cut-down equally.
2. It is preferred but not essential that impellers be cut-down equally.
3. It is preferred that the entire cut be made on the second stage impeller.

Probably the simplest way to illustrate when each of the above answers is applicable is to show sectional assembly drawings of three different pumps and to discuss each in turn. Thus Fig. 1 is typical of a style of pump widely used for capacities up to approximately 2000 gpm and heads to 1000 feet.

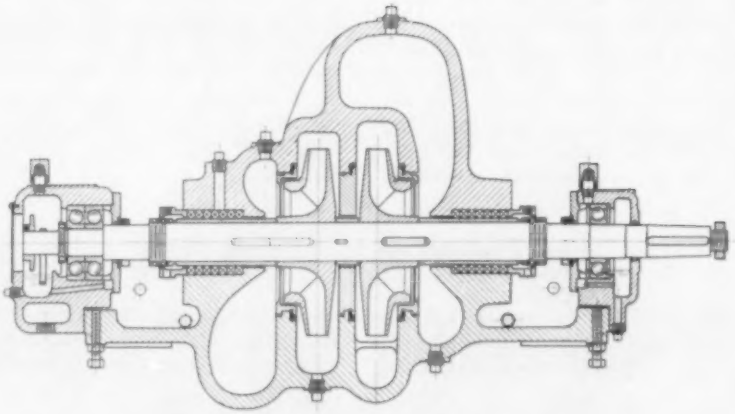


Fig. 1. Each impeller is axially unbalanced.

In this design each of the impellers is axially unbalanced since the back shroud is subject to a pressure nearly equal to that in the volute over its full extent, while the front shroud is subject to an equal pressure only down to the diameter of the wearing ring. This leaves a net unbalanced load acting toward the impeller eye from the center of the pump. However, since the two impellers are mounted back-to-back, the unbalanced loads offset each other and the pump remains in axial balance, provided that the head developed by each impeller is equal.

If one impeller is smaller than the other the axial balance is destroyed, and since the pressures developed by each stage may be fairly high, an axial load of several hundred pounds may be imposed on the thrust bearing. Thus, with a pump of this type, impellers must be cut down equally.

The two stage pump shown in Fig. 2 is a type generally used for larger capacities, and since a double suction impeller is used in each stage, neither creates any axial unbalance. Hence there is no mechanical restriction here on the procedure to be used.

It should be noted, however, that when an impeller is cut-down, it generally becomes less efficient. Furthermore, the rate of efficiency reduction also increases with de-

creasing diameter. Thus for a cut of any significant amount, the pump will perform more efficiently if impellers are both cut equally. This is, therefore, the preferred procedure.

Fig. 3 shows a typical two stage condensate pump. In this design the impellers are mounted face-to-face in order to subject the stuffing boxes to the discharge pressures of the respective stages, minimizing the possibility of air leakage through the stuffing boxes into the pump. Because of the breakdown in total head which occurs in a condensate pump when operating on submergence control, the first stage impeller may be partially (and in some cases completely) ineffective at low capacities.

To avoid a complete and rather lengthy description of the principles of condensate pump application we will simply state here that under these circumstances it is sometimes desirable to maintain the first stage impeller at, or near, maximum diameter and that it is, therefore, preferable that the entire cut be made on the second stage impeller. The resulting axial unbalance is no problem here since the thrust bearing must be designed to take the entire unbalance of one stage anyway due to the possibility of complete breakdown of head in the first stage.

The examples provided cover the conditions most frequently encountered in cutting impellers in two-stage pumps, but are by no means the only possibilities. They do, however, suffice to show that no one procedure will be best in all cases, and that where any doubt exists the manufacturer of the particular pump in question should be consulted.

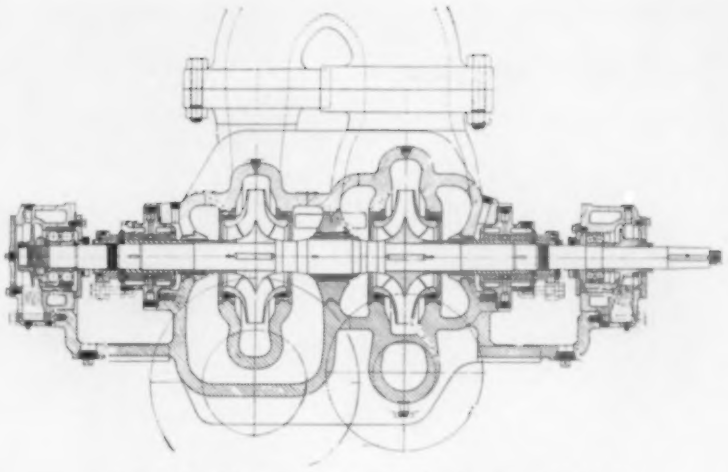


Fig. 2. Double suction impeller for large capacities.

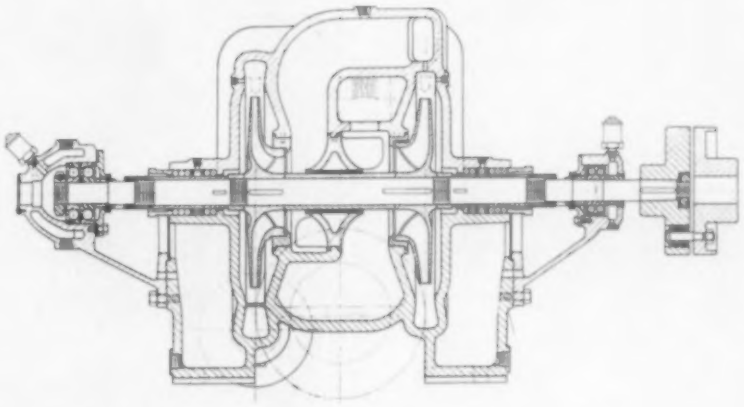


Fig. 3. Typical two stage condensate pump.

QUESTION 2 — Screw Type Couplings

WE HAVE TAKEN bids on several small vertical centrifugal pumps. Examination of the proposals we have received indicates that all the pumps include several screw-type couplings in the shafting. There seems to be no provision for locking these screw-type couplings on the pump shaft. Our installation is such that it is possible to have reverse flow through these pumps — and, therefore, reverse rotation. Is it not necessary to lock these couplings in some manner to avoid unscrewing the couplings?

ANSWER:

NO. SUCH a provision is actually not necessary. The hand of thread used in these couplings is such that during normal pump operation, the torque exerted by the motor tends to tighten the threads in the couplings (Fig. 4). If the motor is stopped and no check valve is available in the pump discharge line, flow through the pump will be reversed, assuming that one or more pumps operating in parallel with the pump in question are kept on the line or that the pump was discharging into a tank or reservoir.

Under these conditions, the pump is transformed into a turbine and becomes the driver, running in reverse rotation to its normal rotation. It produces torque to

(*Continued on Page* 54)

Centrifugal Pump Clinic

(*Continued from Page* 53)

drive itself and the motor. Now the torque developed by the pump acts in the same direction on the threads as when the motor was driving the pump. Therefore, no tendency exists to unscrew the coupling threads and no special device to lock the couplings on the shaft is required.

On the other hand, if the motor of a vertical shaft pump is not wired correctly, the pump will be started in the wrong direction. In this case, the torque exerted by the motor will act to unscrew the coupling from the shaft and serious damage may occur. For this reason, motor disengaging clutches are used in some of the hollow-shaft motors intended to drive vertical pumps. At the same time, there is no reason why a user would fail to try out motor rotation during the initial installation, before the motor has been connected to the pump.

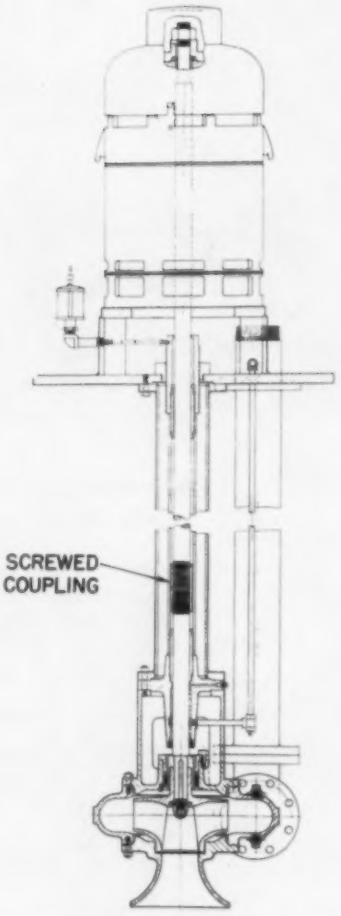


Fig. 4. Vertical pump with screwed coupling.

QUESTION 3 — Extra-Deep Boxes

I HAVE NOTICED that the centrifugal pump specifications used by our company for the purchase of new equipment includes the statement, "The stuffing boxes shall be extra-deep." We apparently use this requirement regardless of the service for which the pumps to be purchased are intended. Is this sound practice or are we paying an extra price for a feature which is possibly not always necessary?

ANSWER:

THIS IS a requirement that is found very frequently in pump specifications and which is, deplorably, extremely vague — one almost might say meaningless. Consider that there are no definite standards by which one can judge the relative depth of a stuffing box.

In general, centrifugal pumps have stuffing boxes designed to hold from five to nine packing rings, depending on the intended service, pump size and operating conditions. It must be assumed that the user will indicate the service to which a particular pump is intended and, therefore, the pump manufacturer is enabled to judge the adequacy of the selection he proposes to furnish.

Since pump designers lay out lines of centrifugal pumps rather carefully, we must presume that barring an infrequent error — and such an error would be soon discovered and remedied — stuffing boxes in standard pump lines are as deep as need be.

Automatic Dispatch Computer — La.

The first complete **Westinghouse Electric Corporation's** automatic dispatching system will go into operation on the **Southwestern Electric Power Company** system in Shreveport, La. in mid-1959.

Controlling two stations, which is a large percentage of the total system generation, the system will automatically control swings and keep the system in economic dispatch. An automatic transmission loss computer is used so that accurate values of bus-bar cost can be calculated.

In addition, by means of a selector switch, the valuation of power at all tie points and bus-bar cost of power at controlled and uncontrolled stations can be determined.

Guide to Federal Retention Requirements

The varying lengths of time that company records must be kept in regard to income and excise taxes, social security, payrolls, etc., have been tabulated in a new report by **Controllership Foundation, Inc.,** New York, research arm of the Controllers Institute of America.

The 242-page study comprises Volume 1 of a series entitled "Corporate Records Retention," and is subtitled "A Guide to U. S. Federal Requirements." Prepared by Robert B. Wheelan, research associate on the Foundation's staff, it lists the general requirements of the Internal Revenue Service, the Labor Department and the Securities and Exchange Commission, plus those of other agencies and departments concerned with government contracts, Defense Material transactions and export and interstate shippers. Among others, these include the Department of Defense, Atomic Energy Commission, Renegotiation Board and Interstate Commerce Commission.

The Foundation guide also lists the federal retention requirements affecting companies in the following 15 major industries: air carrier; aircraft; banking; drug; freight forwarding; motor carrier; natural gas; petroleum; pipeline; public utility; steam railroad; telephone and telegraph; tobacco, and water carrier. The report indicates in which cases, and under what conditions, microfilms may be retained in lieu of the original records.

YARWAY IMPULSE* is the only steam trap that continually samples fluid in the line to maintain condensate discharge close to steam temperature, eliminating condensate as soon as it forms.

Condensate seals the small control orifice against steam leakage under all normal operating conditions.

Here's why your best steam trap buy is Yarway Impulse—

1. GETS EQUIPMENT HOT FAST—AND KEEPS IT HOT
2. ONLY ONE MOVING PART
3. LOW MAINTENANCE
4. SMALL SIZE—LIGHT WEIGHT
5. GOOD FOR ALL PRESSURES
6. NON-FREEZING
7. COMPLETE LINE FOR EVERY REQUIREMENT

ONLY ONE MOVING PART: A SMALL STAINLESS STEEL VALVE, ACTUALLY "FLOATS" ON THE CONDENSATE LOAD.

Actual size ¾" trap

* A COMPLETE LINE OF STEAM TRAPS, ALL OPERATING ON A PROVEN THERMODYNAMIC PRINCIPLE.

YARWAY impulse®

Manufactured by YARNALL-WARING CO.
Home Office—116 Mermaid Ave., Philadelphia 18, Pa.
Southern Office—Bona Allen Bldg., Atlanta 3, Ga.

ATOMIC DEVELOPMENTS

By JOHN F. LEE
SPI Consultant on Atomics,
Broughton Professor and
Head of Mechanical Engineering Dept.
North Carolina State College

The Atom Takes to the Seas

LAUNCHING of the Nuclear Ship Savannah was an important epoch for all of America but it had particular significance for the South. Pressure and reactor vessels came from Chattanooga, fuel elements from Lynchburg, Virginia and the shipside nuclear servicing barge will be constructed in Houston. Myriad parts and components came from a wide variety of small and large industries scattered throughout the South. Although the launching took place in Camden, New Jersey there is a lot of Dixie in the N. S. Savannah.

Aboard Nuclear Ship

When Mrs. Dwight D. Eisenhower shattered the traditional bottle of champagne on the bow of the N. S. Savannah last July, another important American milestone was marked. As the Nuclear Ship Savannah moved down the ways, world attention was focused on the sincere determination of the American people to use the energy of the atom for peaceful purposes.

It was quite fitting that the first lady should christen the world's first nuclear-powered passenger-cargo vessel. The Savannah culminates one of her husband's fondest dreams — a very real and tangible example of his "Atoms for Peace" program.

Next year, when the sea trials are completed, the first mission of the Savannah will be a worldwide cruise to demonstrate the peaceful uses of the atom. To the thousands who have participated in the ship's development, and to the other Americans whose contribution it represents, the Savannah demonstrates an accomplishment to be shared with the rest of the world.

To those fortunate enough to be among the first passengers, the Savannah will offer the ultimate in travel by sea. On boarding her, they will notice the complete absence of smoke stacks, and they will be surrounded by a decor that reflects our atomic age and the historic part the Savannah is playing. She will have accommodations for 60 passengers.

To the crew members and senior deck officers who are responsible for operating the atomic power plant, taking the Savannah to sea will climax months of special training by The Babcock & Wilcox Company at Lynchburg, Virginia, designer and builder of the vessel's propulsion system.

Some crew members will have spent a minimum of 15 months of concentrated study under nuclear specialists of Babcock & Wilcox's Atomic Energy division in Lynchburg to learn the what, how and why of her atomic heart. These men are the cream of the merchant marine fleet, and are probably the most carefully selected and highly-trained crew ever assembled for a single merchant ship.

States Marine Lines, which will operate the Savannah, has estimated that more than $400,000 will have been invested in the crew by the time the vessel goes into regular service. The Savannah is a true pioneer. Her atomic power system contains one of the most advanced, yet conservatively designed, pressurized water reactors in existence.

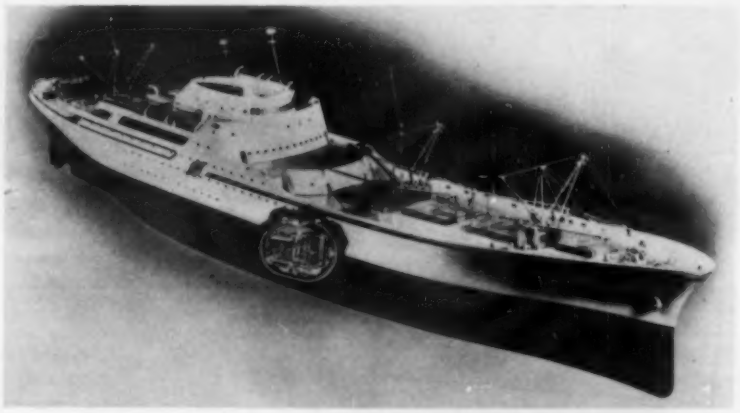


Fig. 1. N. S. Savannah

in buying coal

COST PER MILLION BTU IS NOT THE ONLY ANSWER

Cost per million Btu is important in buying coal . . . but it's only part of the story. Factors such as ash-fusion temperature, sulfur content, volatile content, free swelling index, sizing, production and preparation facilities at the tipple are most important. Various types of fuel-burning equipment demand special coal-burning characteristics.

Proper coal preparation means a desirable product. A typical washing and thermal drying operation, for example, changes raw coal with high ash and high total moisture to a finished product with low ash and low total moisture.

Fuel Satisfaction . . . the coals mined along the Norfolk and Western . . . are generally high in Btu content. In addition, they are mined and prepared by the most modern methods to produce coals that are high in "use values". Because there are many types of coal mined along the N&W, we can recommend one that exactly suits your equipment and your needs. For a careful analysis of your coal requirements, get in touch with one of the N&W bureaus listed here.

CONTACT YOUR N&W COAL BUREAUS

ROANOKE
N&W Coal Traffic Dept.
Telephone Diamond 4-1451
Ext. 3313, 423, 3249, 3732
Roanoke, Virginia

BOSTON
833 Chamber of Commerce Building
Telephone Liberty 2-2229
Boston 10, Massachusetts

CHICAGO
660-664 Marquette Building
140 S. Dearborn Street
Telephone RAndolph 6-4634
Chicago 3, Illinois

CINCINNATI
913 Dixie Terminal Building
Telephone DUnbar 1-1325
Cincinnati 2, Ohio

CLEVELAND
Room 722,
The Illuminating Building
Telephone MAin 1-7960
Cleveland 13, Ohio

DETROIT
1514 Book Building
Telephone
WOodward 1-2340 or 1-2341
Detroit 26, Michigan

ST. LOUIS
2059 Railway Exchange Building
Telephone MAin 1-1180
St. Louis 1, Missouri

WINSTON-SALEM
1105 Reynolds Building
Telephone PArk 2-7116
Winston-Salem 1, North Carolina

Norfolk and Western RAILWAY

CARRIER OF FUEL SATISFACTION

To her designers, builders, operators, and the Maritime Administration who sponsored her, the Savannah is also a "sea-going test tube." Design and operational characteristics will be checked and verified. Her "fuel consumption" will be watched carefully.

One fuel loading, it is calculated, will keep the Savannah in operation for at least three and one-half years, or equivalent to almost 15 times around the earth at the equator. The Savannah's nuclear power plant will propel her at a cruising speed of 21 knots (25 mph). While the ship's power plant could have been designed to move her faster, speed was subordinated to safety, efficiency and dependability.

What men learn from it will lead to future nuclear ships that will carry passengers on ocean crossings as swiftly as the fastest luxury liners afloat today. Designed to carry 10,000 tons at a steady 21 knots, the Savannah already represents increased payload capacity by virtue of eliminating fuel storage on board.

No expense has been spared to provide an abundance of safety features. The reactor's containment vessel and radiation shielding alone weigh 1900 long tons. In addition, the ship has safety circuits which do nothing but check on other safety circuits. The average radiation exposure received by a passenger will be about 0.15 rem ("roentgens equivalent mammal") per year, which is comparable to the exposure a person normally receives on land due to soil radioactivity and cosmic radiation.

Present plans call for a dockside operation requiring highly-skilled, specially-trained personnel. Actual operating experience will lead the way to simplified methods. All equipment that might fail during operation in the containment vessel has been installed in duplicate, or provision has been made to isolate the faculty equipment from the rest of the plant.

The Power Reactor

Figure 2 shows the power reactor which can also be seen in the cutaway view of Figure 1. Located amidship, the 26½-foot tall, 145-ton reactor houses the core of uranium fuel elements and the control rods. In the reactor vessel, heat is produced by the fission of uranium atoms.

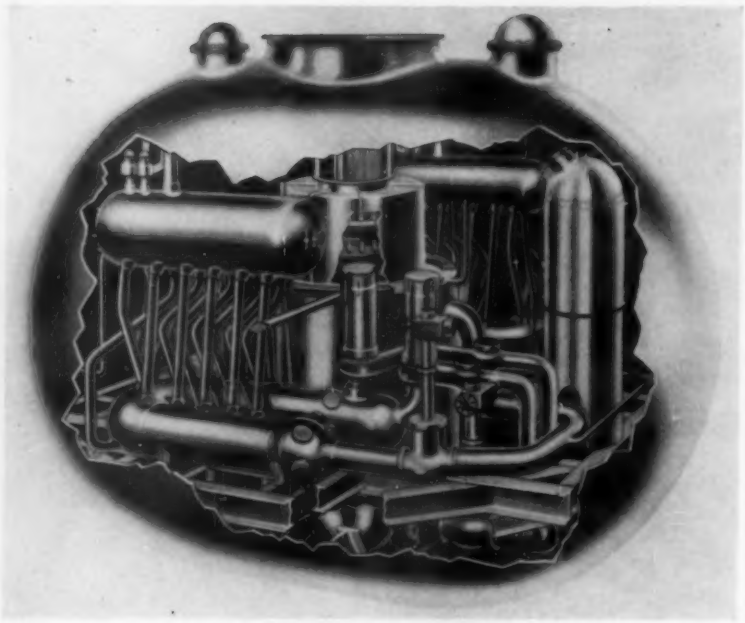


Fig. 2. Power reactor for N. S. Savannah

The inside of the reactor is completely shielded with stainless steel to protect the 6½-inch thick steel plating against the ravages of 1750 psi radioactive water surrounding the fuel elements. Stainless tubing tested to many times actual working pressures conducts pressurized fluid from the reactor to the heat exchangers, where steam is produced to drive the ship's power turbines.

The reactor designer estimates the merchant vessel could travel as much as 350,000 miles on one fuel loading. Within the reactor are 32 fuel elements, each containing 164 fuel rods of type 304 stainless steel. The interior of each stainless rod is filled with sintered uranium oxide pellets that act as fuel. Each of the 164 fuel rods are composed of four bundles of 41 rods each. Rod spacing is maintained by small tubular stainless steel ferrules, brazed in place about every eight inches along the 76-inch long element.

Fuel elements fit into an "egg crate" type lattice which provides the equivalent of a pressure can around each element. To withstand the pressure differentials created during reactor operation, the latticework is constructed of stainless steel, ranging in thickness from 0.094 to 0.109-inches thick.

Modulation of the nuclear reaction is achieved by 21 control rods, each shaped somewhat like a cross. Control rods are 0.375-inch thick stainless steel of sandwich design: a 3/16-inch thick plate of boronated stainless between two 3/32-inch thick stainless steel plates. The reactor vessel containing the fuel elements is approximately 27 feet tall by 11 feet in outside diameter, with an inside diameter of about 7½ feet.

Vessel walls are 6½ inches thick. The entire interior surface of the vessel is clad with stainless steel, 0.109 inches thick. The metal container is designed to operate at 650 F confining water coolant at 2000 psi. The bottom head of the reactor vessel is forged from a 58,646-pound circular plate of carbon-silicon steel, 15-feet in diameter. Before forming, the plate surface which became the inside of the forged head was clad with type 308L low carbon stainless steel. The reactor head is believed to be the largest, thickest and heaviest pressure vessel closure ever forged in one operation by die-forming.

Water coolant for the reactor is

(*Continued on Page* 59)

ATOMIC DEVELOPMENTS

(*Continued from Page 58*)

circulated by four primary circulating pumps of the canned rotor type. All primary pumping is made from type 304 stainless steel hollow forgings with a design pressure of 2000 psi. Two heat exchangers act as steam generators to convert superheated, pressurized reactor water to steam for the power turbines. Each generator consists of a U-shell, U-tube boiler about 20 feet long over-all, and contains about 800 stainless steel tubes ⅝ inches OD.

Servicing Barge

A contract for construction of a shipside nuclear servicing barge, to service the Nuclear Ship Savannah and nuclear-powered ships of the future was awarded to Todd Shipyards, Houston Plant, Houston, Texas, by the Maritime Administration, U. S. Department of Commerce, and the Atomic Energy Commission. The non-propelled nuclear servicing vessel, costing $569,165, is to be used in nuclear ship maintenance, refueling, and waste handling operations.

The servicing vessel will have an over-all length of 129 feet, a beam of 36 feet, and a design displacement of 650 tons. It was designed by Electric Boat Division of General Dynamics Corporation under an AEC contract. The barge will have a highly compartmented hull for maximum stability and buoyancy.

Other features of the barge includes a hold approximately amidship, for possible future storage of expended fuel elements. Facilities also will be installed for processing radioactive liquid and solid wastes and preparing them for disposal. Radiological monitoring and safety equipment will be installed for use in servicing operations, decontamination of reactor system components and refueling equipment, and environmental surveys.

EDITOR'S NOTE:

Mr. Lee's monthly columns in SPI normally deal with "Atomics in Industry" — developments for the Savannah are covered because of the close relationship.

Keep pace with your space . . .

CYCLOTHERM

provides for

tomorrow's heating today

The Cyclotherm you install today will meet your steam requirements for many years to come. But time does fly and businesses do grow. And when you make a plant addition 18 Cyclotherm models, with 18 different boiler horsepowers, are ready to match new space with new heating capacity.

The Cyclotherm Steam and Hot Water Generator is built under one roof with one manufacturing responsibility backing the entire equipment—shipped fire-tested and ready to operate. Up to ⅓ smaller than other package generators of same capacities and needing no excavation, no foundation, no costly stack.

Electronic controls operate the Cyclotherm automatically. On units of 80 HP or more, modulation controls regulate firing rate from 30% to 100% of rated capacity without loss of efficiency. Smaller models automatically *off* when steam demands are satisfied, automatically *on* when more steam is needed. Operation stops if firing sequence is interrupted and unit fails safe. Cyclotherm cuts maintenance costs by up to 50%.

Cyclotherm meets all state requirements, conforms to A.S.M.E. and National Board standards, carries Underwriters' Laboratories label. Burns oil and/or gas. Steam generators: 15 to 750 HP. Hot water Generators: 670,000 to 6,700,000 BTU per hr.

At the Frederick Leighton School, Oswego, N. Y., two 100 HP Cyclotherms keep 21 classrooms and 550 pupils warm and comfortable. Building designed by Ketcham-Miller-Arnold Architects of Syracuse, N. Y.; Consulting Engineer Cedric R. Acheson, also of Syracuse.

YEARS AHEAD IN STEAM & HOT WATER GENERATION

CYCLOTHERM®

Steam & Hot Water Generators

Division of National-U.S. Radiator Corp.
51 E. First St., Oswego, N. Y.

Clip to Your Letterhead:

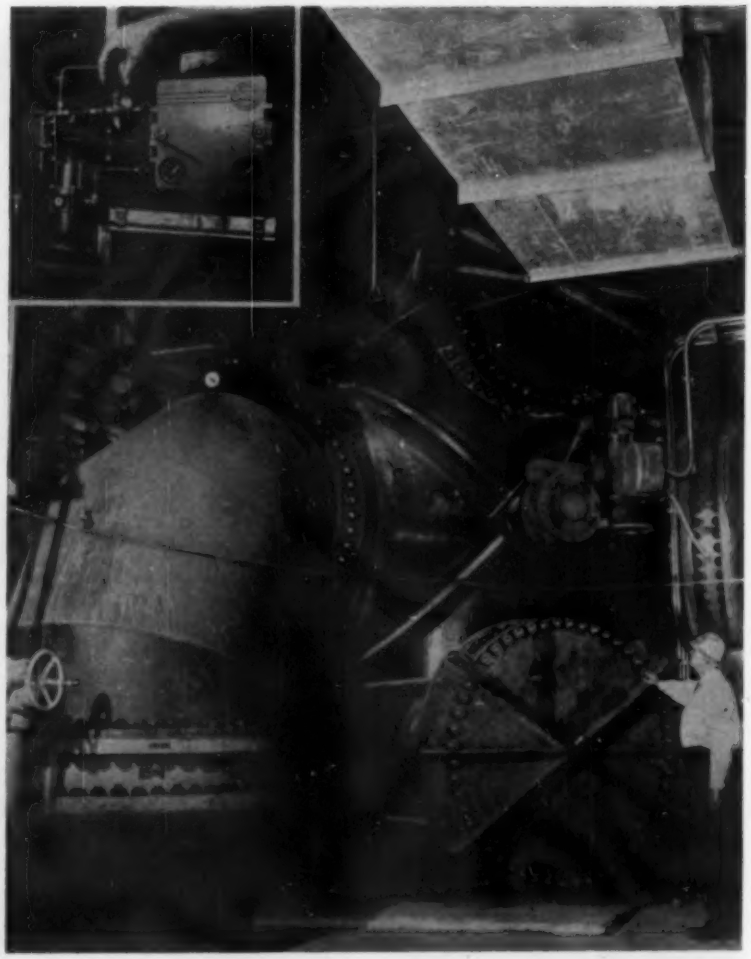
51

Please send me full information about Cyclotherm Steam and Hot Water Generators.

How Many Valves in a Big Plant?

8,000 AT MEMPHIS

Reported by the design engineers for Allen Steam Generating Plant — and they cost $1½ million



Giant and midget. Between the 90-degree elbow and the flange at right is one of the reversing valves in a condenser intake line. The operating motor is seen at center. This is the largest valve in the Thos. H. Allen Station, Memphis, Tenn. Insert shows a ¼-in. instrument valve on a pneumatic control line.

OVER 8,000 VALVES have gone into the Thos. H. Allen Electric Generating Station at Memphis, Tenn.

Two 5-ft diameter reversing valves, standing 18 ft high and weighing 16 tons each, were installed in each condenser for backwash. Each condenser also has four 9½-ft-high butterfly valves — these weigh "only" 4 tons — and there are six more such valves at the pump house, one in each discharge line.

The small valves are found mostly on instrument lines. Between the two extremes, the plant will have practically every type of valve made: gate, globe, butterfly, check, control, safety, relief, deluge, diaphragm and siphon breaking valves; pressure-reducing, flow-control and temperature-controlled valves; solenoid operated, motor-driven, pneumatic, and hand-operated valves.

Burns and Roe, Inc., engineers who designed the plant for the Memphis Light, Gas and Water Division and who are supervising its construction, calculate the investment in valves alone to be $1.½ million, or about 1¼ per cent of this $121 million project. Valve costs break down as follows: $500,000 for 57 high-pressure valves for boiler feed and bleed steam systems; $250,000 for 36 circulating water system valves; the remainder for standard valving.

Based on demand growth surveys made by Burns and Roe, the installation is being built with provisions for doubling its initial 750,000-kw nameplate capacity by 1965.

Each of three steam generators, among the highest-pressure natural circulation boilers ever built, will drive an associated turbine-generator unit.

During full operation, more than six million pounds of steam per hour at 2475 psig and 1053 F will be required. Because of this high temperature and pressure, main steam piping has been designed with walls which are over 3 in. thick.

A list of principal equipment suppliers for the Allen Station was published in SPI, June 1959.

Maintenance Scheduling

SOMETIMES general maintenance jobs accumulate faster than the maintenance crew can perform them and still take care of the emergency calls as they come in. Nevertheless, these general maintenance jobs have their important place in the successful and profitable operation of any manufacturing plant.

We have found that the best way to get the general maintenance jobs done in their proper order is to have a definite schedule for them. To do this we are using a simple card system, listing but one job on each card.

These cards are then put in the order of their importance. As finished, each job is pulled.

New jobs are added on new cards.

The big advantage is the ease with which the order of importance can be changed or new jobs can be inserted without disturbing the proper sequence of already existing cards. Also, emergency jobs are performed as needed without disturbing the card schedule. We suggest you give it a try.

By R. V. WILK, Supt.
Day-Brite Lighting, Inc.
St. Louis, Missouri

Simple Device Cuts Packing Cost

CONSIDERING the cost of packing, the overtime pay involved or the loss of production on the machine being packed, packing of piston rods was becoming a major expense in our plant.

Upon making a personal investigation of the matter I found that packing failure in every instance was due to the packing being improperly cut. In most cases the error would be in the degree of the bevel at the end of each piece of packing, but in some cases a piece would be a fraction too short or long.

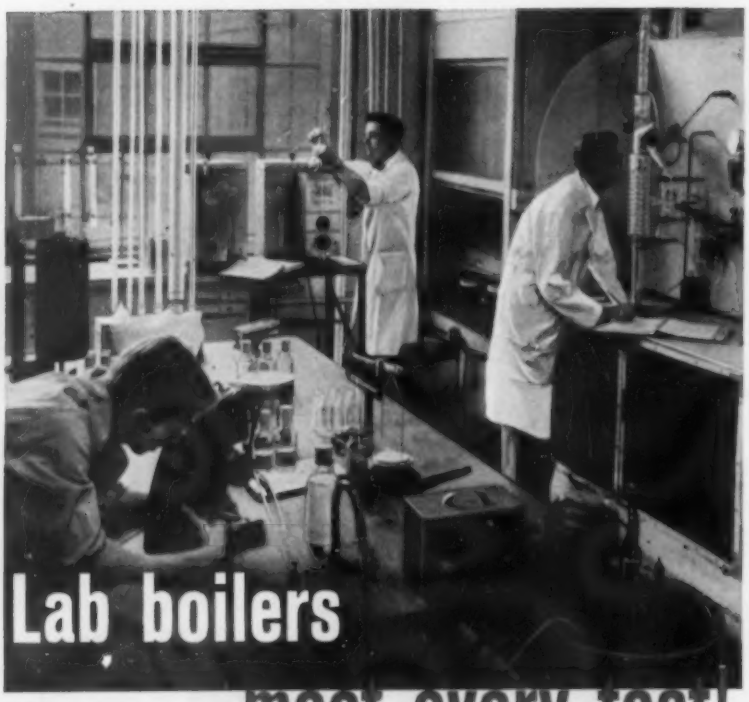
I realized these errors were not

Pennies for Prevention Beat Dollars for Repair

Expensive boiler and air conditioning equipment must be kept clean of corrosion, scale and sludge to operate at peak efficiency, and avoid costly repairs. Industrial Products Company feedwater treatment for industrial steam-water systems, approaches and corrects the problems peculiar to the Southeast. IPCO service provides accurate analysis and recommendations for chemical treatment to prevent formation of scale, corrosion and sludge. Technical work by Industrial Products Company professional chemical engineers and chemists, who survey and evaluate water conditions of your particular location, assure you proper internal treatment methods. All equipment and procedures including in-plant chemical control backed by laboratory analysis and research give your preventive maintenance program the necessary complete follow-through. Industrial Products Company has a field engineer near you who is thoroughly experienced in industrial water treatment. Write today for complete information.

IPCO PRODUCTS

IPCO LABORATORIES, Inc.
FORMERLY INDUSTRIAL PRODUCTS CO.
2710 APPLE VALLEY ROAD, N. E.
ATLANTA 19, GEORGIA



Two Cleaver-Brooks 150-hp boilers satisfy all demands for steam at Shell Chemical Corporation's Union, New Jersey Technical Service Laboratories

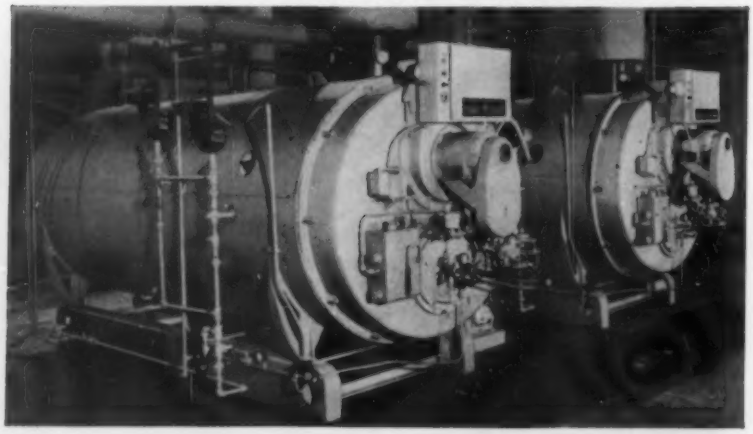
"We find Cleaver-Brooks boilers meet every test we have given them for top operating performance," reports George Baranchulk, utilities and service engineer at Shell's research building. Mr. Baranchulk goes on to say, "There is extreme versatility to our load as our requirements for heating and experimentation may run as low as 10 hp in the summer to over 140 hp in the winter. Checks we have made of CO_2 and stack temperatures indicate we are getting excellent operating efficiency — even when we vary the load over widely separated peak and low demands. These boilers have definitely lived up to every claim you have made for them."

Put Cleaver-Brooks packaged boilers to the test! They are available in sizes from 15 to 600 hp . . . for oil, for gas or for oil/gas combination firing. Contact your representative or write Cleaver-Brooks Company, Dept. 345, 343 E. Keefe Ave., Milwaukee 12, Wisconsin.

Cleaver Brooks®

ORIGINATORS AND LARGEST PRODUCER OF PACKAGED BOILERS

TESTING — Fully modulated Cleaver-Brooks boilers burning No. 6 oil supply steam for heating presses, constant temperature rooms, laboratory uses, laminating plastics and air conditioning system. Sold and serviced by Miller & Chitty Company, Union, N.J.



the result of carelessness or poor workmenship but were due to difficulty of seeing and reaching the rod to be packed, plus the improbability of cutting a proper slant on extra hard packing.

All these errors were overcome by calibrating each piston rod to determine the exact length the packing should be and making a holder to facilitate cutting the packing right.

This packing holder can be made in a few minutes by placing the size packing to be cut in the center of a short board and nailing a strip of wood down each side of the packing. Then a 45 degree slot is sawed in the strips of wood at the exact length the packing is to be cut, or if a straight cut is preferred a straight slot can be cut in the strips.

The slots serve to guide the knife or hack saw in cutting the packing at the proper degree and length. The strips should be higher than the packing to be cut. For instance if the packing is ½" the strip should be ¾" high. This is to guide the cutting instrument into the packing at the proper angle.

If convenient the strips may be nailed to a work bench. Packing of the same size may be cut different lengths on the same holder by cutting slots in the strips at the desired lengths.

Some of the improvements I have observed since using this method of cutting packing are as follows:

Our four hundred and sixty horse power steam engine, which requires 4½ pounds of ⅞" high-pressure packing, now runs six months on one packing whereas before it required packing every three weeks. Packing time has also been cut from approximately two hours to thirty minutes.

Our water pumps which required packing every six months have now been operating for two years without being packed. The same is true of some of our hydraulic equipment.

With these facts in mind I highly recommend this method of holding and cutting packing.

By WOODY WOODROOF, Chief Engineer, Emporia Manufacturing Co., Emporia, Virginia.

These 4 steps show why SPANG brings you the best galvanized steel pipe!

THOROUGH CLEANING of the pipe before galvanizing removes all dirt, grease and scale, leaves a clean surface for the prime western zinc galvanized finish.

STEAM-WIPING of the pipe's exterior, as it comes from the kettle through an air ring, produces a smooth even finish that will stand up under rough usage.

SUPERHEATED STEAM blown through the pipe interior removes excess zinc inside, assures a smooth uniform surface for easy flow of liquids.

QUICK QUENCHING of the pipe in a sodium dichromate solution bonds the galvanized finish to the steel, adds extra service to the life of the pipe.

This is just part of the *quality-control* processing that each length of Spang Steel Pipe receives. Careful control from skelp through the inspection tables assures you of a *top-quality* pipe for *top-quality* installations. Next job, make it steel pipe . . . make it Spang! Your local Spang Distributor is at your service!

SPANG® CW® STEEL PIPE

THE NATIONAL SUPPLY COMPANY

Subsidiary of Armco Steel Corporation

TWO GATEWAY CENTER, PITTSBURGH, PA.

MANAGEMENT CLINIC

Conducted by ROBERT H. EMERICK, North Charleston, S. C.

Periodic Re-Appraisal of Employees

Question . . . . . .

RECENTLY one of our top executives while walking through the plant, fired a journeyman welder on the spot for what the executive called shoddy work. This man had been with us for more than five years, and of course a grievance developed.

Aside from the justice or injustice of our executive's action, the rest of us in production saw in the incident a reason for considering the periodic re-qualification, or appraisal, of all our employees. We think such a program would keep good men on their toes and point out to less effective ones, the need for study and improvement.

Has the experience of industry in general with appraisal plans been good, poor or indifferent?

Suggestion . . . . . .

THERE SEEMS to be no doubt that the periodic re-qualification of men in the highly skilled trades, such as welding, is desirable. This is particularly true when critical muscular coordination is involved, a coordination that may be affected adversely by aging or illness.

Relevant to the case described, the Federal Government long required annual re-qualification of their welders, a practice that has been changed to make the re-qualification tests a matter for supervisory decision. Under this new plan, a craftsman can be ordered to requalify at any time his supervisor finds his work efficiency falling off. Spot dismissals are thus avoided.

For non-craft employees, some form of annual appraisal is in effect with many companies. Forms vary all the way from the simple Civil Service "unsatisfactory-satisfactory-outstanding," to the elaborate "fitness reports" of service personnel.

A really careful appraisal should consider these three aspects of each employee:

1—What he has accomplished — or failed to accomplish.

2—How well he is doing with his present job.

3—His potential for future jobs.

Since one person's appraisal of another is always affected, even unconsciously, by personal liking or disliking, every job should be described in writing, its responsibilities and demands clearly stated. Against so concrete a standard, performance must be rated with a truer lack of bias than is otherwise likely.

We know of a department head whose career was a more or less continuous conflict with the president of his company. He was extremely despondent about his future. But when the need came for a new vice president, his performance appraisals were so high that the president promptly appointed him to the better job.

The point is, a recorded appraisal prevents snap judgments.

Fire Protection

SIX VITAL POINTS in an automatic sprinkler system that bear regular watching are outlined concisely in a report by Pinkerton's to its own force of uniformed security guards.

The national agency, which operates more than two thousand plant protection and security installations for business and industry, notes that most often it is the uniformed guard's responsibility to inspect the sprinklers.

Although on each installation the guard force should have specific instructions, according to Pinkerton the following generally are the vital points of sprinkler system which require watching:

1. **Shut-off valves** — These obviously must be kept open. Though some systems have automatic alarms to detect this, the security guard should immediately report any valve found shut.
2. **Air pressure**—It must be kept up to insure proper flow of water from pressure tanks and to prevent tripping of dry-pipe systems. Excessive high or low pressure should be reported immediately.
3. **Steam pressure** — This must be maintained constantly for engine-driven fire pumps. Gage readings below required minimums should be reported right away.
4. **Power supply**—At some installations fire pumps are driven electrically. Guards should check the electricity supply regularly.
5. **Water level** — Where gravity tanks are the source of water, the required water level must be maintained.
6. **Water temperature** — Temperature in outdoor tanks must not drop to the freezing point. If an automatic alarm has not been installed to warn of dangerous temperature drop, the guard should be detailed to check the heating apparatus.

Not part of the sprinkler system itself, but a serious condition to be reported by the uniformed security guard, is any obstruction, such as merchandise piled high under sprinkler heads, that can seriously impair ability to douse a fire.

RETURN LINE CORROSION *Can* BE LICKED!

Drastic reduction of return line corrosion in an easy, effective and economical way has been the unanimous experience of hundreds of plants throughout the country using Bird-Archer's Amine Treatment.

A plant in New York State, generating approximately 500,000 lb. of steam a day, had a normal condensate pH value of 6.3 that resulted in almost constant piping replacements. Only 6 lb. per day of Bird-Archer's Amine Treatment cut maintenance costs to a new low by raising the pH value to the safe range of 8.0 to 8.5.

A plant in New England, generating 600,000 lb. of steam a day, did not have an open feedwater heater which would mechanically eliminate the exceedingly high CO_2 content of their makeup water, consequently, the pH value of their condensate was sometimes as low as 5.9. Less than 12 lb. of Amine Treatment a day raises the pH value of the condensate to 8.5, eliminates excessive corrosion.

After two years of experience with Amine Treatment a power plant in Massachusetts, making 250,000 lb. of steam a day, enthusiastically reports that they eliminate over 75% of their piping replacements through the use of only 2 or 3 lb. a day of Amine Treatment.

Return line corrosion has been licked at these plants. Let a Bird-Archer Service Engineer help you solve *your* corrosion problems.

Write for Bulletin CP100 and the name of the Bird-Archer Service Engineer nearest you.

BA-801

BIRD-ARCHER
WATER TREATING CONSULTANTS
The BIRD-ARCHER Company, 4337 N. American St., Phila. 40, Pa.
New York • Chicago
The BIRD-ARCHER Co. of California, 415 Brannan St., San Francisco
Offices in Canada and Mexico

Steel for Florida

A NEW STEEL MILL on the outskirts of Tampa is a realistic symbol of progress in Florida's industrial expansion. The Mill was built by Florida Steel Corporation with main office in Tampa and with subsidiary construction and distributing organizations in Jacksonville, Miami and Orlando.

From drawing board to rolling the first concrete reinforcing bars took about one year, according to R. R. Black, designer of the mill and now its General Manager. Black came to Florida Steel with 30 years experience in steel manufacturing in Europe, South America and Pittsburgh.

"While only concrete reinforcing bars are being manufactured now," states D. F. Taylor, President of Florida Steel Corporation, "we will eventually produce light structural beams and merchant bars. We plan the addition of two electric furnaces of the same capacity which will triple production to 450 tons of steel every 24 hours."

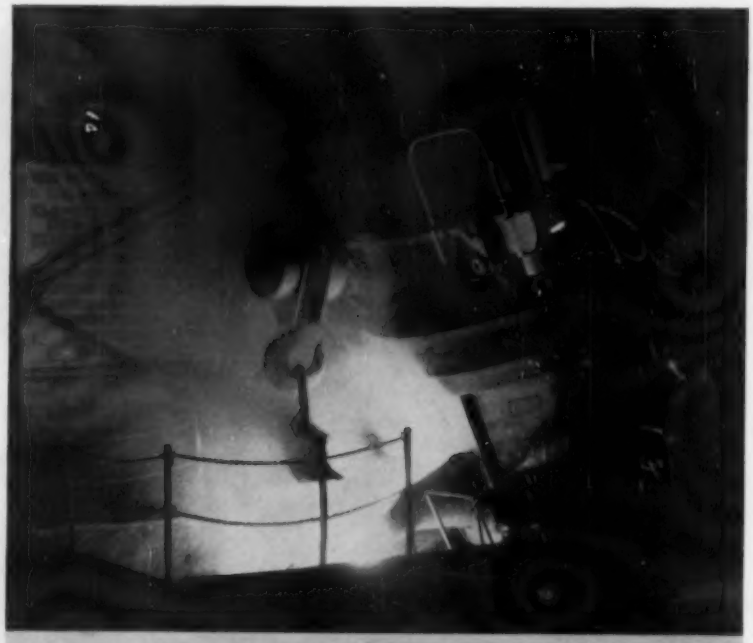
The Electric Melt Shop is 70 feet by 300 feet long and has a 70 foot by 262 foot scrap yard. The steel making facilities are composed of one top-charge Whiting Hydro-Arc electric furnace 11 feet in diameter rated at 15 tons per heat. It is powered by a 6000 kw transformer and uses 14 inch electrodes. The operation is serviced by two overhead cranes, one a 35 ton ladle crane with a 10 ton auxiliary hoist and one 10 ton scrap yard crane.

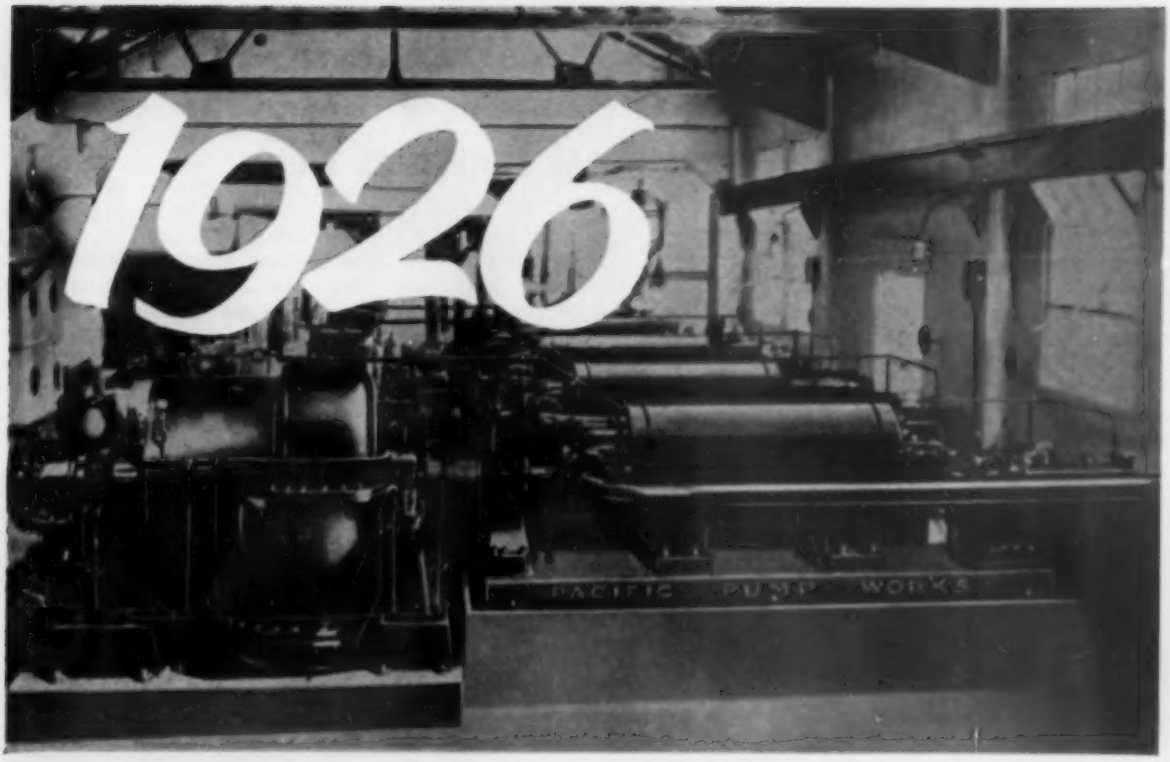
Charges are made up in conventional type charging buckets. It takes approximately 4 to 5 charges per heat. Steel from the electric furnace is cast into 300 pound ingots.

Two hydraulic pushers charge 2 rows of ingots into the reheat furnace. The ingots are heated at 2200 F by 9 burners with an input capacity of 67,250,000 Btu per hour. This furnace presently burns bunker C grade fuel oil, it will be converted to natural gas when the pipeline now under construction reaches Tampa. The ingots move on water cooled skids onto a refractory hearth.

The ingots are pushed out of the reheat furnace by a mechanical ram type pusher onto a conveyor. The conveyor carries the ingots to the 18" Roughing Mill. The ingot is rolled in 5 or 7 passes to the desired cross section for further rolling in a 5 stand 12" looping mill.

The bars leave the 18" mill at 450 feet per minute. The bar is guided through the 5 stands by repeaters. The finished bar comes out of the last stand at 1000 feet per minute. It travels on to a 230 ft long cooling bed. From there it is cut to length, bundled and ready for fabrication. 2,500,000 gallons of water are used per day for cooling in the furnaces and mills.





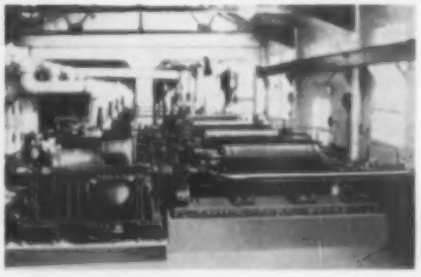
PACIFIC PUMPS

first "FIRST"

The centrifugal pumps designed and built for Pan American Oil Company's new high-pressure cracking process in 1926 was one of the most significant engineering achievements of the Twenties in the refinery processing field. The first of many Pacific Pumps' "FIRSTS", this particular pump was the forerunner of today's greatly improved Pacific centrifugal process pump line. Over the years Pacific has built and installed thousands of vertical and horizontal centrifugal pumps for extreme pressures and temperatures demanded by the petroleum, chemical, petro-chemical and allied industries. In addition, Pacific designs and manufactures boiler feed pumps for the power industry, steam turbo-pumps for the marine and power generation fields, and plunger pumps for oil-well service.

This first Pacific advertisement appeared in several petroleum publications early in 1927

2000 POUNDS PRESSURE WITH CENTRIFUGAL PUMPS



View of recent installation of four "PACIFIC" Multi-stage Pumps at Pan American Petroleum Company Refinery, Los Angeles. Each Pump delivers a capacity of 400 Gallons Per Minute of Oil against a pressure of 2000 pounds. Pumps are driven by 750 H. P. Steam Turbines. Each Pump weighs nine tons and was required to pass a hydrostatic test of 5000 pounds pressure.

We are prepared to make prompt shipment of Booster Pumps for Pipe Line or High Pressure service. Special Pumps designed for unusual conditions.

PACIFIC PUMP WORKS
350 Bicket Street Huntington Park Los Angeles, Cal.

Write for
Bulletin 1C

PACIFIC

Offices in all Principal Cities

PACIFIC PUMPS

Inc. . . A Division of Dresser Industries, Inc.

HUNTINGTON PARK, CALIFORNIA

Texas Gulf Sulfur Co. Kept Hot

Spun Mineral Wool Conserves Heat

SULFUR is easiest to handle in its liquid state. That's the way it's mined today, and keeping it molten throughout processing and distribution simplifies many handling problems. The only trouble is, to do this you have to keep it hot — about 265 F — so that it doesn't solidify to clog pipes or storage vessels.

The photograph shows the insulation of two new liquid sulfur storage tanks, recently erected by the River Transportation Company. Each tank is 65-ft in diameter and 27-ft tall and is heated by 40 psi steam passing through 3200 lineal feet of 1½-in. pipe running inside the tank walls, floor and roof.

Since the maximum temperature of these heated tanks is relatively low by industrial insulating standards, spun mineral wool felt, manufactured by the Baldwin-Hill Company, was selected as the basic insulating material.

A 2-in. thickness of this material will reduce the outer surface temperature of the storage tanks to below 100 F, thus reducing heat loss to the atmosphere. The fibrous felt has a maximum general service temperature limit of 450 F and in this application its thermal conductivity (k factor) is less than 0.30 btu per sq ft, hr, deg F per inch of thickness, or an overall conductivity of less than 0.15 btu per sq ft, hr, deg F in this application.

First, stainless steel studs 2½-in. long and 5/16-in. in diameter, were welded to the exterior tank walls — one stud to each 3 sq ft of surface. Then 2- x 4-ft sheets of the resilient insulating material were impaled over the studs and held in place by annealed iron tie wires laced from stud to stud in a diamond pattern. Around manholes and other openings and protrusions in the tank wall, the felts were simply cut to the desired shaped with a knife.

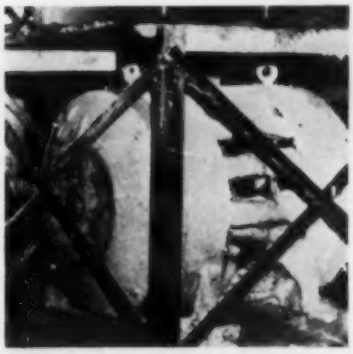
A sheet metal raincoat of corrugated aluminum was then applied to protect the spun mineral wool felts from the weather. The 3- x 12-ft sections of aluminum were first hung on the studs, which protrude ½-in. beyond the surface of the insulation, and fastened securely with stainless steel nuts. The sheets were placed so that each circumferential row laps on the one below by 3-in., and adjacent sheets in each row overlap a minimum of 1⅛ corrugation. Sheet metal screws join adjacent sheets at the lapped joints.

Because the tank roofs must occasionally support personnel, more rigid insulating materials were used here. This thermal barrier consists, from the inside out, of 1½-in. roof insulation board, ½-in. compressed wood fiberboard, and 3 courses of 15-lb roofing felt. The surface of the top roofing felt was hot mopped with asphalt and covered with a layer of gravel.

The barges are brought up-river two to a tow in seven days and return empty to Beaumont, Texas in four and one-half days. The liquid sulfur is pumped from the 2500 ton capacity barges and into the tanks through 460-ft long, 8-in. diameter steam traced lines. These lines are also insulated with 1½-in. pipe insulation. One of a series of similar liquid sulfur depots which are being installed in other sections of the country, the terminal provides 24-hr service for Texas Gulf customers in Ohio, Indiana, Kentucky, West Virginia and Pennsylvania.

Motor Takes It

WHEN Crossett Paper Company opened its $18,000,000 pulp and board mill, the only place to install a huge 100 hp constant-speed motor to drive a fan pump on one cylinder of its new board machine was directly under the wet end of the machine itself. Any ordinary motor subjected to this constant drenching with water and wet, sticky, corrosive pulp would soon find its insulation deteriorating, its windings and bearings clogged and overheating.



Reliance 100 hp, totally-enclosed, fan-cooled a-c motor, although drenched with pulp and water, continues to drive a fan pump on one cylinder of the board machine at Crossett Paper Company, Crossett, Arkansas, twenty-four hours a day.

Reliance Electric and Engineering Company supplied a totally-enclosed, fan-cooled motor with a high-velocity fan. Being completely sealed against water and pulp, the enclosed motor frame keeps windings and bearings dry and free from foreign contaminants. The high-velocity fan tends to "push" splashing pulp off the frame. Even that which remains is not sufficient to hamper the cooling effects of the rapid flow of air over the motor.

KEEP-UP-TO-DATE
USE SPI
READER SERVICE

See Pages 91 & 92

Around-the-clock operations at the Champion Paper and Fibre Company's sprawling Pasadena, Texas, plant called for illumination of a million square feet of wood storage area. And just thirty-two 1,000-watt Wide-Lite area lights were required to provide the answer – uniform coverage without distracting glare or dangerous dark areas.

Designed especially to enhance the unique characteristics of color-corrected mercury vapor lamps, Wide-Lites bring *new dimension* to area lighting. They produce broad patterns which provide smooth, even coverage without hot spots or dark shadows. The patterns may be accurately plotted to determine the exact number of units needed to provide any desired level of illumination.

Ruggedly constructed from cast aluminum alloy, Wide-Lites are finished in aluminum epoxy paint for corrosion control. Outdoor models are sealed with tempered glass lens, and re-lamping is accomplished without disturbing the seal of the lens. Exclusive built-in heat radiating fins limit lamp temperatures to the most efficient range. A choice of reflectors is available on all models, and sizes range from 100 watt to 1000 watt.

To assist you in planning efficient working coverage of outdoor working areas, Wide-Lite engineers have prepared a unique group of transparent plotting curves. Write today for your set!

WIDE-LITE.

manufactured by
WIDE-LITE CORPORATION
P. O. Box 191 • Houston 1, Texas
In Canada: Wide-Lite Division of Wakefield Lighted Limited
London, Canada

OUTDOOR AREA LIGHTS • INDOOR LUMINAIRES • SPORTS LIGHTS • PROTECTIVE LIGHTS

Problem: A NEW MANUFACTURER OF BOATS NEEDED TO FIND A RELIABLE SOURCE OF SUPPLY FOR ALUMINUM SHEETS

Solution:

IN AUSTELL, GEORGIA, a manufacturing operation was begun in the summer of 1957. This company, Pioneer Manufacturing Company, produces a line of aluminum pleasure boats, weighing from 88 pounds apiece up to much larger craft. Mr. J. O. White (far right), the owner, needed a source of aluminum, one that he could rely on to stock the material he needed and deliver it when he wanted it.

MR. WHITE called John Cook at our Atlanta Branch and told him about his requirements. Mr. White wanted to get started right away, and John arranged for his first order, 500 pounds of 5052 H34 aluminum sheets, to be loaded on one of our trucks and delivered the same day. Since that day two years ago, every one of Pioneer's numerous orders has been delivered on time, saving Mr. White the trouble and high cost of stocking large quantities of aluminum in his own shop.

THE SEASONAL BUSINESS that Mr. White has is an important factor for any small manufacturer. While he operates continuously through the winter to stockpile boats for the spring, demand naturally is subject to considerable fluctuation during the season. It is extremely important to Mr. White to have a source of supply flexible enough to meet unexpected calls for material. The ability to ship immediately out of stock plays a vital part in Reynolds Aluminum Supply Company's service to Mr. White.

THIS SAME STORY could be told about any one of the ten Reynolds Aluminum Supply Company branches. Vast inventories of metals and other industrial products are maintained constantly. Having these materials available to you in the quantities you need, large or small, at the times you need them, is our whole purpose. It will pay you to call our branch nearest you today and turn your inventory problems over to them. The address and telephone number are listed below.

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

ALUMINUM MILL PRODUCTS
INDUSTRIAL BUILDING PRODUCTS
STEEL FLAT SHEETS
BRASS & COPPER
STAINLESS STEEL

SERVING WHEREVER YOU ARE IN THE SOUTH

REYNOLDS ALUMINUM SUPPLY CO.

Established 1914

GENERAL OFFICES: ATLANTA, GA.

ATLANTA, GEORGIA
1530 Ellsworth Drive, N. E.
SYcamore 4-9511

LOUISVILLE, KENTUCKY
Fern Valley Rd. & Crittenden Dr.
EMerson 6-0314

NASHVILLE, TENN.
Harrison St. at 7th Ave.
ALpine 5-1152

BIRMINGHAM, ALABAMA
2828 Fifth Avenue, North
FAirfax 2-5461

MEMPHIS, TENNESSEE
703 North Royal Avenue
JAckson 5-4717

RALEIGH, N. C.
1431 Courtland Drive
TEmple 4-6221

JACKSONVILLE, FLORIDA
1612 E. Eighth Street
ELgin 6-7636

MIAMI, FLORIDA
3690 N. W. 52nd Street
NEwton 5-0647

RICHMOND, VIRGINIA
1910 Petersburg Pike
BElmont 2-6748

SAVANNAH, GEORGIA, 309 Stiles Avenue, ADams 6-2461

Steel and masonry are combined here for an attractive plant. This Armco Building has 100-foot clear span width.

For economy and quality specify Armco Steel Buildings

Whether you are planning an office building, warehouse, gatehouse or an entire plant, you can meet your exact needs with an Armco Steel Building. Specify exactly what you need from thousands of sizes of Armco Buildings—each with an unequalled selection of accessories, doors, windows and other special features that give you an economical finished structure tailored for your operations.

You get a high-quality building, too. STEELOX® wall panels lock together to form a tight weatherseal. Heavy-gage walls are up to twice as thick as ordinary steel covering.

Interiors can be insulated and completely finished with standard material. Exteriors take any kind of architectural treatment.

Armco STEELOX construction withstands heavy wind and snow loading . . . lasts indefinitely. There's nothing to warp, crack or burn. Maintenance costs are practically eliminated.

For complete information on Armco Steel Buildings, use the coupon. Armco Drainage & Metal Products, Inc., P. O. Box 1343, Atlanta, Georgia, or C&I Life Building, Houston, Texas. Other offices in principal cities.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
(Mail to office nearest you. See above.)

Send me data on Armco Steel Buildings for the following uses:

_____

Approximate size_____

Name_____

Address_____

City_____ Zone_____ State_____

FINANCING ARRANGEMENTS AVAILABLE

ARMCO DRAINAGE & METAL PRODUCTS

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

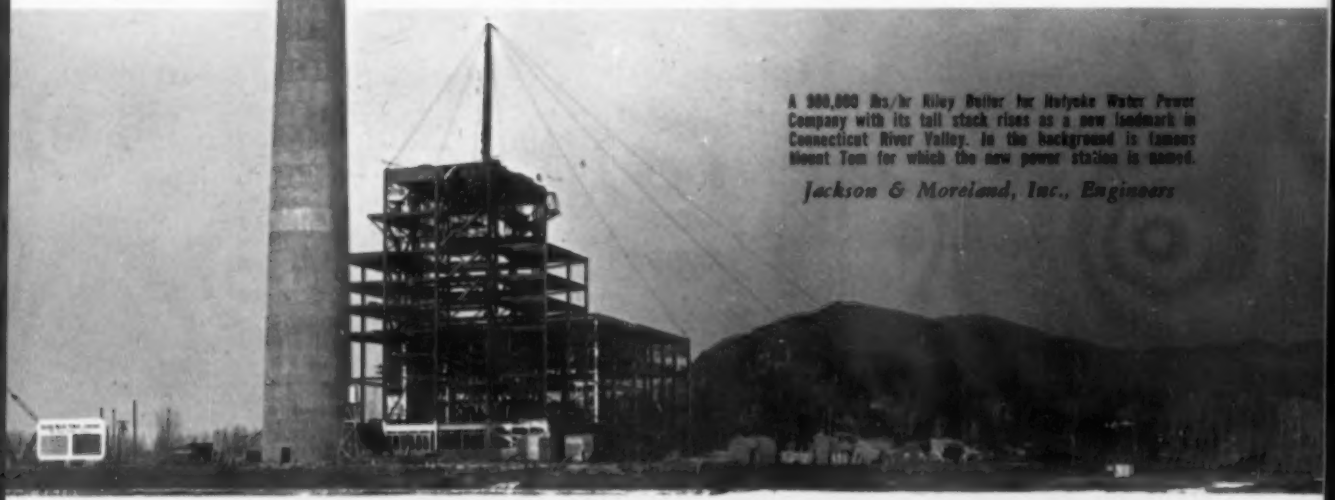
RILEY CENTRAL STATION UNITS

Landmarks From Coast to Coast

A decade of growth of the electric power industry and of Riley Stoker Corporation, one of America's leading suppliers of steam generating and fuel burning equipment, is symbolized in these Central Station installations and customers — representing a few of the many Riley Central Station Boilers that have been installed in this period of great expansion.

Now, a new era of growth is here. New Riley boiler designs and fuel burning techniques will provide the high degree of dependability and efficiency required.

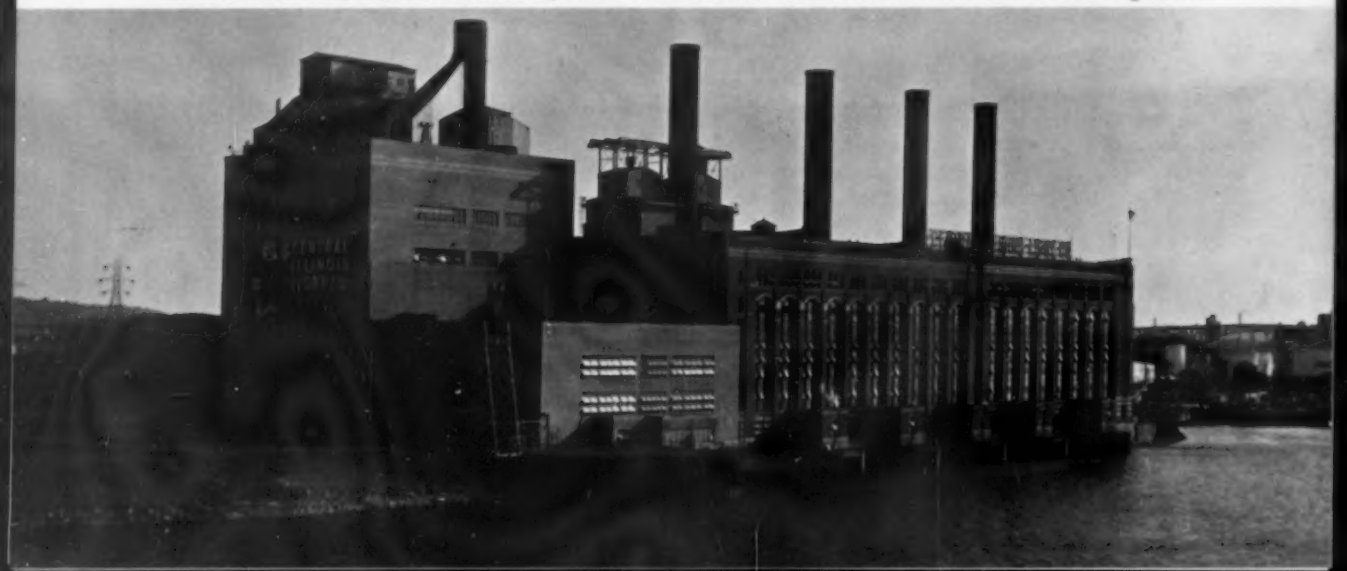
For details on the latest Riley developments consult your Riley representative.



A 900,000 lbs/hr Riley Boiler for Holyoke Water Power Company with its tall stack rises as a new landmark in Connecticut River Valley. In the background is famous Mount Tom for which the new power station is named.

Jackson & Moreland, Inc., Engineers

Below — Central Illinois Light Company's R. S. Wallace Station has had Riley Units installed since 1939. The latest is a 690,000 lb/hr Riley Reheat Unit. Another Riley 825,000 lb/hr Unit is being installed at LaMarsh Station. *Commonwealth Associates, Inc., Engineers.*



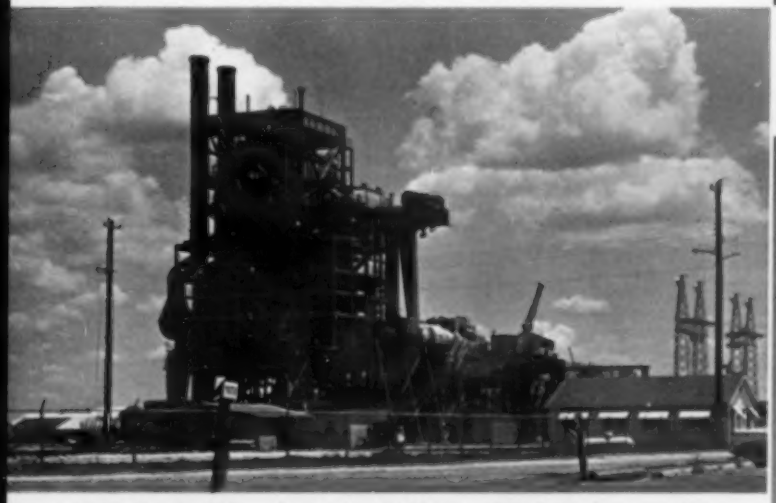
A Few of the Many Public Utility Companies That Are Using Riley Steam Generating Equipment

Houston Lighting & Power Co.
New Orleans Public Service Co.
Monongahela Power Company
Southwestern Gas & Electric Co.
Public Service Co. of Indiana, Inc.
Columbus & Southern Ohio Electric Co.
South Carolina Electric & Gas Co.
Northern Virginia Power Co.
Southwestern Public Service Co.
Union Electric Co. of Illinois
Taiwan Power Co. (Formosa)
Iowa-Illinois Gas & Electric Co.
Montana-Dakota Utilities Co.
Delaware Power & Light Co.
Minnesota Power & Light Co.
Central Louisiana Electric Co.
The Hartford Electric Light Co.
Manila Electric Company
Union Electric Co. of Mo.
Ohio Edison Company
Public Service Electric & Gas Co.
Dallas Power & Light Co.
Texas Electric Service Co.
Louisiana Power & Light Co.
Potomac Edison Co.
West Penn Power Co.
Arkansas Power & Light Co.
Utah Power & Light Co.
Florida Power Corporation
Florida Power & Light Co.
Central Illinois Light Co.
Southern Nevada Power Co.
Northern States Power Co.
Commonwealth Edison Co.
Gulf Power Co.
Pennsylvania Electric Co.
Interstate Power Co.
Philadelphia Electric Corp.
Kansas Gas & Electric Co.
Pacific Gas & Electric Co.
Holyoke Water Power Co.
Mississippi Power Co.
Worcester County Electric Co.

A survey of your plant by qualified consulting engineers could show ways of making substantial savings in your power costs.

Above — The 870,000lb/hr Riley Turbo Furnace Unit at the Permian Basin Steam Electric Station of Texas Electric Service Co. which has two other Riley Units in its system.

Ebasco Services, Inc., Engineers



Houston Lighting and Power Company has installed twelve Riley Boilers in the past twenty years. Here is a recent installation at the North Houston Steam Electric Station.

Four 1,000,000 lb/hr Riley Pulverized Coal Fired Reheat Boilers are being installed here at New Albany Power Station by Public Service Company of Indiana, Inc.

Sargent & Lundy, Engineers

RILEY

STEAM GENERATING & FUEL BURNING EQUIPMENT

RILEY STOKER CORPORATION, WORCESTER, MASS.

Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Jacksonville, Kansas City, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Salt Lake City, San Francisco, Seattle, St Louis, St. Paul, Syracuse, Worcester.

"More than Nine Million Tons hauled in 18 years without shutdown for major repairs... —that's a pretty good record!"

—says M. K. LaRue

Chief Engineer,
NATIONAL CEMENT COMPANY, Ragland, Alabama

"When Continental installed this 24-inch belt conveyor line in 1941, it was designed to haul 196 TPH. As plant capacity increased, the load went up correspondingly. Today its normal operation is at 155% of rated capacity, and on test it has operated satisfactorily at 192%. It is estimated that in its 18-year lifetime, it has hauled more than 9,000,000 tons of crushed cement rock and shale, and has never been shut down for major repairs."

To which we can only say, *"Thank you, Mr. LaRue!"*

Continental Belt Feeder under secondary crusher.

In its 1¼-mile run, this unique conveyor carries 304 TPH over rolling terrain (and under a highway) at very low cost.

For all your material handling needs . . . . . See your Authorized Continental Distributor

CGC

INDUSTRIAL DIVISION

Continental Gin Company

BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • HOUSTON • HUNTINGTON • MEMPHIS • MOBILE • NEW YORK 17

FUTURE EVENTS of Engineering Interest

Sept. 17-19: 41st Annual Meeting, Public Utilities Assoc. of the Virginias. The Greenbrier, White Sulphur Springs, W. Va. Robert W. McKinnon, Exec. Secy., PUAV, 602 First Federal Bldg., Roanoke, Va.

Sept. 21-22: 57th Fall Meeting, Steel Founders' Society of America, The Homestead, Hot Springs, Va. SFSA, 606 Terminal Tower, Cleveland 13, Ohio.

Sept. 27-30: 3rd Annual National Power Conference: ASME and AIEE, co-sponsors; Hotel Muehlebach, Kansas City, Mo. Fred P. Gilpin, Kansas City Power & Light Co., Box 679, Kansas City 41, Mo.

Sept. 28-Oct. 1: Fall Meeting, American Welding Society, Sheraton-Cadillac Hotel, Detroit, Michigan. AWS, 33 W. 39th St., New York 18, N. Y.

Oct. 22-25: Annual Meeting, American Society of Industrial Designers, Grove Park Inn, Asheville, N. C. ASID, 15 E. 48th St., New York 17, N. Y.

Nov. 5-6: 8th Annual Instrumentation Conference, School of Engineering, Louisiana Polytechnic Institute, Ruston, La. Stewart Baggarly, Publicity Chairman, 8th Annual Instr. Conf., Louisiana Polytechnic Institute, Ruston, La.

Nov. 16-20: 5th International Automation Exposition & Congress, New York Trade Show Bldg., 500 Eighth Ave., New York, N. Y. Richard Rimbach Assoc., Inc., 845 Ridge Ave., Pittsburgh 12, Pa.

Nov. 30-Dec. 4: 27th Exposition of Chemical Industries: New York Coliseum. E. K. Stevens, Mgr., 27th Exposition of Chem. Ind., 480 Lexington Ave., New York 17, N. Y.

Grass Dehydration, Pellet Plant — Ga.

Construction is underway in Cairo, Ga., on a Coastal Bermuda grass dehydrating and pelleting plant, and feed operation, by **Graco Dehydration, Inc.** It will be the first such commercial operation in Georgia and the fourth in the Southeast.

The new plant will represent an investment of $250,000, or more, not counting operating capital, and will initially provide some 30 new jobs. The plant will consist of two buildings — 100x250 feet and 60x150 feet — with completion anticipated by early September.

Significantly, Grady Dehydration, Inc. will contract for the initial production of Coastal Bermuda grass on 700-800 acres of farm lands within a 10-mile radius of Cairo, thus providing a new source of farm income for the area.

Graco Dehydration, Inc., a closed corporation, is acquiring the corn milling plant formerly operated as Graco Grain & Elevator, at the spacious site, but has purchased additional property adjoining for the two new buildings now under construction. The dehydrating plant, which will use a substantial quantity of natural gas, and the pelleter plant, will be installed in connection with the existing facilities, which will include corn processing and a grain bank for farmers.

The new operation is planned on a basis of southeastern development projections to 1975. Coastal Bermuda grass is one of the highest yielding forage crops ever known. In addition to its high yielding qualities, it has been found to contain amazingly valuable feed nutrients for beef cattle, hogs and poultry, which, as feed supplement, cuts the conversion rate almost in half.

The plant and operation here will represent an extensive financial outlay, all factors considered, but it is another pioneering venture in a long series for which this area is noted that has bright promise for the years of more scientific farming that lie ahead.

Similar commercial plants are already in operation at Estell, S. C. and Laurinburg, N. C. There is a private plant at Sylvania, Ga. and an experimental plant at Blackville, S. C. A small plant was recently established at Callahan, Fla. but it does not provide for quick dehydration.

PLANT PERSONNEL

Engineering-Management Promotions Announced by Major Southern Plants

Robert J. Bathe, presently the manager of the Control Assurance Div. of Century Electric Co. in St. Louis, Mo., has been named the manager of the new plant the company is constructing in McMinnville, Tenn.

Chemstrand Corp. has appointed **Robert L. Granger** as plant manager for its planned nylon plant at Greenwood, S. C., which is expected to be ready for production by late 1960. Mr. Granger is presently yarn manufacturing superintendent at the company's nylon plant at Pensacola, Fla.

The Greensboro, N. C. plant of Amp Inc., which will be in production in November, will be managed by **Steve Hobar,** who is now manager of Amp's plant at Williamstown, Pa.

Hugh Barlow has been named plant manager for the Chattanooga, Tenn. branch plant of the Elastic Corp. of Hickory, N. C.

Plant Supervisor for the newly created Alabama Service & Equipment Co., Inc. of Phenix City, Ala. is **Gene Ray,** and **William Cline** is production manager.

Woodworking Plant Underway in La.

$200,000 woodworking plant nearing completion in Arcadia, La. for **Cook and Co.** of Hazelhurst, Ga.

The plant, which will employ approximately 60 people, will manufacture wood parts for the automotive-truck and farm implement industries.

Feed Mill for Georgia

September completion is anticipated for the $150,000 feed mill to be constructed for **C & S Milling Co.** in Douglas, Ga. The mill will manufacture feeds for Swift & Co. to be sold under the company's feed label.

Southern News Briefs

Vulcan Steel — Birmingham

Vulcan Steel Container Co., has announced the appointment of **David W. Lynch** as Sales-Service Representative with headquarters in Birmingham.

Mr. Lynch has been active for the past twenty years in the sale of basic insecticides and chemicals to the Pesticide and Sanitary Supply industries. His wide acquaintance in this and other similar fields gives him a diversified background of experience to provide a complete and reliable steel packaging service.

Metals & Controls — Texas Instruments

A merger of **Metals & Controls Corp.** into **Texas Instruments Inc.** is planned for submittals to the stockholders of both companies.

Texas Instruments, a twenty-nine year old company, with approximately 7,500 employees, is engaged in the manufacture of electronic and electro-mechanical systems and apparatus for defense and civil departments of the Government; is a leading manufacturer of semiconductor devices, including the transistor; and is the world's foremost geophysical exploration contractor for petroleum, with crew operations in twenty countries of the free world. Texas Instruments has manufacturing plants in Dallas and Houston, Texas and Bedford, England, and sales offices throughout the world.

Metals & Controls, a forty-two year old company, with approximately 3,000 employees, is engaged in three primary activities in the United States and abroad: The fabrication and sale of clad metal products for use by the electrical, nuclear, jewelry and other industries; the manufacture of thermostatic controls for industrial and motor control uses under the name of Spencer Thermostat, identified by the trade name Klixon; and in the business of providing nuclear fuel elements and cores to the U. S. Navy and other customers.

C. J. Thomsen, Director and Vice President of Texas Instruments, has been elected President of Metals & Controls. Mr. Thomsen is replacing **G. L. Williams**, formerly acting President of Metals & Controls who will retain his position as Director and Treasurer of Metals & Controls and as President and Treasurer of M & C Nuclear, Inc., a wholly-owned subsidiary of Metals & Controls. In the interim, prior to approval of the merger by stockholders of both companies, Mr. Thomsen will resign his positions with, and be on leave from, Texas Instruments.

Chemstrand — Ala.

The promotion of **John C. Fisher** to Director of Purchasing for the **Chemstrand Corporation** has been announced. Mr. Fisher succeeds Norman C. Stiles who has been appointed Director, Foreign Services.

Fisher has been with Chemstrand since September, 1951 serving in the Purchasing Department as buyer and later as staff purchasing agent. Prior to joining Chemstrand, he was with John W. Galbreath & Company of Columbus, Ohio.

A-C Acquires S. Morgan Smith

Allis-Chalmers acquisition of the **S. Morgan Smith Co.**, York, Pa., has been finalized following approval by S. Morgan Smith stockholders. **The York Works of Allis-Chalmers**, as it will be known, becomes the 20th plant in the Allis-Chalmers family.

Acquisition was made through the exchange of 1.1 shares of Allis-Chalmers common for each share of S. Morgan Smith capital stock outstanding. This required 434,764 Allis-Chalmers common shares. Allis-Chalmers had sufficient unissued stock to carry out the transaction without requiring an increase in the authorized common.

In taking over the S. Morgan Smith facilities, W. G. School, Exec. V. President of A-C, announced the formation of the hydraulic division of the Industries Group with headquarters at York, Pennsylvania.

Beauchamp E. Smith has been named general manager of the hydraulic division. He has served as president of the S. Morgan Smith Co. for the past 17 years.

Burwell B. Smith, who had previously been vice president in charge of sales and engineering of S. Morgan Smith Co., will become assistant general manager in charge of sales.

Duncan D. McArthur, formerly vice president and secretary and treasurer of S. Morgan Smith Co., will be assistant general manager and will have charge of industrial relations, procurement and the controller's departments.

William J. Rheingans, who has been manager of the hydraulic department at the West Allis Works of Allis-Chalmers, will move to York, Pa., to become assistant general manager in charge of engineering.

The new hydraulic division becomes a part of the Industries Group headed by J. L. Singleton, group vice president. Singleton is also a member of the company's Board of Directors. No other changes in the management structure of the York Works are being made.

Chase Brass — N. O.

Chase Brass & Copper Co. has announced that the New Orleans warehouse is now located at 1000 South Jefferson Davis Parkway, New Orleans 25.

The new facility contains 3,000 square feet of air-conditioned office space. It is complete with off-street parking and truck-loading, overhead crane service, and the most modern materials handling facilities, all in the heart of downtown New Orleans.

Mr. Brunner

Mr. McQuaid

Md. Shipbuilding & Drydock Co.

The appointments of **Philip F. Brunner** as Director of Purchases and **James A. McQuaid** as Assistant Director of Purchases have been announced by the **Maryland Shipbuilding & Drydock Company** in Baltimore.

Zero-Max Memphis Representative

The Craig Industrial Equipment Company of Memphis, Tenn., has been appointed Memphis territory representative of **The Zero-Max Company**, a sales subsidiary of Revco, Inc., in Minneapolis, Minn. **E. S. Craig** will be the principal representative for the territory which includes Western Tennessee, Northern Mississippi, Northwest Alabama and Eastern Arkansas.

The Craig Company, located at 1101 Poplar, has been handling industrial accounts for more than eight years.

The Zero-Max Company manufactures variable speed reducers for fractional horsepower motors. Their product, Zero-Max, is an infinitely variable speed control used in powering and controlling feeds and drives on various industrial machinery.

In Dust Collection Systems...

SF Precipitator at a steel plant.

design makes the difference

Higher efficiency of Buell 'SF' Electric Precipitators is the result of exclusive engineering features. For example, Buell's *Spiralectrodes* emit 50% to 100% more electrons than other types . . . and *maintain* their efficiency. Positive gas flow control through adjustable baffles prevents scouring and eddying. And Buell's Unique Continuous Cycle Rapping practically eliminates "puffing".

BUELL CYCLONES

"SF" ELECTRIC PRECIPITATORS

PRECIPITATOR-CYCLONE COMBINATIONS

Lower installation cost of Buell's time-proved simplified design makes erection faster and easier. Spiralectrodes, for example, are self-tensioning, require no weights. Flexibility of power supply means easier installation, operating safety.

Lower maintenance cost is the result of many details of superior design. And sectionalized design permits shutting down part of a unit without interrupting service in the rest of the unit.

Get full information: write for a copy of "Buell SF Electric Precipitators", a 22-page booklet. Write to Dept. 80-I, Buell Engineering Co., Inc., 123 William Street, New York 38, N. Y.

buell®

Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS

A. M. Byers — Pa.

Ralph E. Whittaker, Jr. has been appointed steel sales manager for **A. M. Byers Company**, Pittsburgh, Pa.

Mr. Whittaker, a graduate of the University of Pittsburgh, was formerly associated with Universal-Cyclops Steel Corporation in various sales and technical capacities.

American Enka Acquires Wm. Brand

American Enka Corp. has agreed to purchase the business of the **William Brand & Co., Inc.**, a producer of plastic insulated wire and cable for the radio, television, aircraft, missile, electronic and electrical industries, according to an announcement made by Alfred W. Brand, president of the firm.

American Enka, which is headed by J. E. Bassill, was formed by a Dutch group, Algemene Kunstzisde, N. V., which exercises 55 per cent control. It is the second largest rayon producer in the world.

The Brand Co., which employs 350 in its Valley Street and North Windham plants and an additional 50 in Santa Monica, California, is a privately owned corporation, wholly controlled by the Brand family. There was no announcement of the sales price.

American Enka Corp., with plants in Enka, N. C., and Lowland, Tenn., manufactures rayon and nylon for textile and industrial uses and is one of the largest producers of Tyrex, a new type of viscose tire yarn.

The acquisition of William Brand & Co. is the second step in a diversification program started by Enka in 1957. Last year it acquired the Rex Corp. of West Acton, Mass., another producer of wire, cable and insulating material for the communications and electronics industries.

Reynolds Aluminum Sales Names V.P.s

Ernest W. Schaw and **Fitz L. Sargeant** of **Reynolds Metals Company**, general managers of the southeastern and south central sales regions respectively, have been elected vice presidents of **Reynolds Aluminum Sales Company.**

The promotions were announced by David P. Reynolds, executive vice president of Reynolds Metals Company, the parent firm.

Mr. Schaw joined Reynolds in 1935 as a mail boy in the company's New York office and later became a salesman. He became district sales manager for Boston in 1944 and for Cincinnati in 1947. In 1951 he moved up to his present assignment, managing the company's sales in the southeastern region, with headquarters in Camden, N. J.

Mr. Sargeant joined the company in 1941, in purchasing and traffic assignments connected with construction of the firm's first primary reduction plant at Listerhill, Ala.

On completion of the plant he took up production control duties, first at Listerhill and later at the Louisville, Ky. extrusion and reclamation plants. In 1944 he entered industrial sales as district manager in Kansas City, moving up to divisional manager in New York in 1948. He was promoted to his present position in charge of sales for the southeastern region in 1952. His headquarters are in St. Louis.

Circular Slide Rule

General Industrial Co. has introduced a handy circular Slide Rule for engineers and other plant and office executives. Any executive who must perform multiplication and division calculations will find this convenient, pocket-size calculator extremely useful in his work.

Operation of the rule is simple and the results are accurate. To multiply, divide and find proportions is easy and exceptionally fast with this convenient 4" circular rule. Complete easy-to-follow instructions will be included with each slide rule.

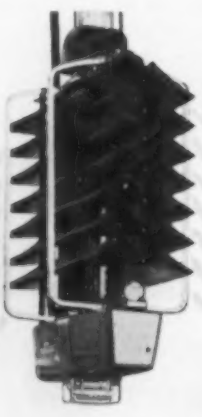
For your free Circular Slide Rule, write on your business letterhead to General Industrial Co., 5738 Elston Ave., Chicago 30, Illinois. To those of our readers who do not qualify as an engineer or other business executive to receive a free slide rule — General Industrial Co. will be pleased to send one for 50c.

Jeffrey — S & SW

The **Jeffrey Manufacturing Company**, Columbus, Ohio, has appointed additional distributor representatives in the South to handle the company's line of industrial equipment.

New distributors include: Bearings and Drives, Inc., 658 Northside Drive N.W., Atlanta, Georgia; Piedmont Mill Supply Co., Inc., Salisbury, N. C.; Mechanical & Electrical Equipment Co., 1410 East 6th Street, Tulsa 20, Okla.; Tennessee Belting & Supply, Inc., 2334 Shawmut Avenue, N.W., Knoxville, Tenn.; Mississippi Bearings, Inc., Jackson, Miss. and Hall Bearing Company, 1304 Throckmorton Street, Fort Worth 2, Tex.

infra-red heat



CLEAN, QUICK, LOW-COST HEAT FOR COMMERCIAL AND INDUSTRIAL BUILDINGS

Overhead gas-fired Panelbloc heaters provide the perfect solution to Commercial and Industrial heating problems. Panelbloc heats with infra-red radiation, has no fans or motors — nothing to wear out — doesn't even need electrical connections or wiring. Panelbloc heat is directed and focused — just like a beam of light. No cold floors, no hot ceilings with Panelbloc. Low in first cost, they require negligible maintenance and are easy to install. Users report spectacular fuel savings. Why not get the facts today?

Just clip this ad to your letterhead and mail. D

PANELBLOC DIVISION

The Bettcher Mfg. Corp.
3106 West 61 St., Cleveland, Ohio

Eastman Chemical — Greensboro, N. C.

A new sales territory with headquarters in Greensboro, North Carolina, has been established by the plastics division, **Eastman Chemical Products, Inc.** Manager of the new office at 435 Jefferson Standard Building, is **John M. Marvin.**

The new territory, which has been created in order to satisfy increased customer demand and give improved service in the area, will include Virginia, North Carolina, and parts of South Carolina, Tennessee, and Kentucky. Other regions in the area formerly served by the company's Atlanta, Georgia, sales office will continue to be served by that office.

Mr. Marvin, who comes to his new post in Greensboro after more than 11 years with the Eastman organization, previously was sales representative at the company's Leominster, Massachusetts, office.

Eastman Chemical Products, Inc., is a subsidiary of Eastman Kodak Company. Headquartered at Kingsport, Tennessee, it markets the Tenite plastics — acetate, butyrate, propionate and polyethylene — to molders and extruders who convert them into steering wheels, telephones, housewares, toys, pipe, film, and other industrial and consumer products.

Anderson Electric — South

Gregory-Salisbury & Company, Inc., has been named manufacturers representative in Louisiana, Arkansas, and parts of Mississippi and Tennessee for **Anderson Electric Corporation** of Birmingham, Alabama.

Territory for the new representative is the same as that formerly serviced by Anderson's own representative, **John B. Rogers.** Mr. Rogers recently returned to Anderson's Birmingham headquarters to become Distribution Division product manager.

The area will be covered by fourteen sales representatives operating from five offices. These are located in New Orleans and Baton Rouge, La.; Jackson, Miss.; Memphis, Tenn.; and Pine Bluff, Ark. The offices in the southern part of the territory will be under the supervision of **H. S. Gregory** while those in Jackson, Memphis, and Pine Bluff will be under the direction of **T. M. Salisbury.**

DON'T OVERLOOK THIS COST SHEET!

YOU CAN REDUCE MANY OF THESE COSTS!

By having the refrigeration system designed to meet your specific requirements and by buying the entire system of equipment from a manufacturer with a background of experience and reputation in this highly specialized field.

Frick Company has been designing, manufacturing, and installing commercial and industrial refrigeration systems since 1882.

Whatever type you need—cold storage, ice making, air conditioning, quick freezing, very low temperature, or process cooling—Frick engineers will design a system to serve you with dependability and economy.

Let **FRICK ENGINEERS Provide a Frick System for You Today.....**

OFFICES AND DISTRIBUTORS WORLD-WIDE

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U. S. A.

use this door-way

TO 15 MILLION TONS OF "PRESCRIPTION COALS"

A network of Massey sales offices and sales representatives, reaching from Florida into Canada, is linked at all times by teletype and telephone to Massey mines and processing plants.

RESULT: efficient service and prompt, dependable delivery to fill your "prescription" from Massey's 21 famous brands. Next time coal is your concern—call on Massey's 15 million ton annual output.

A. T. MASSEY COAL CO., INC.

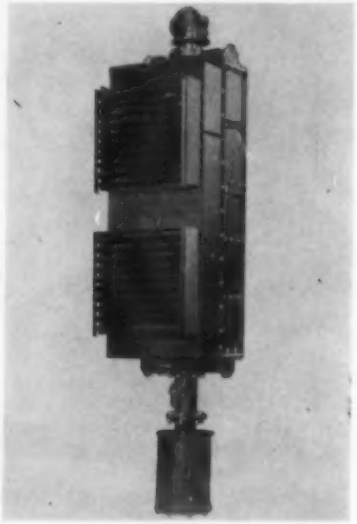
General Offices: Massey Building
Richmond, Virginia
CINCINNATI CHICAGO
DETROIT CLEVELAND
TORONTO

NEW Product Briefs

. . . there is always a BETTER WAY

Improved Coolers for Power Transformers

J-1 Improved coolers are being used on forced - oil - cooled power transformers of **General Electric Co.**, Schenectady 5, N. Y.



The oil pump was previously located above the oil-to-air heat exchanger, near the transformer tank cover. Recent research has shown that the pump's location could be changed without losing positive pressure in the heat exchanger.

An improved fan, which is slower and quieter yet moves more air than the former type, is now being used. New louvers in front of each fan direct cooling air upward, away from the tank, and help prevent air recirculation.

All-Electric Steam Cleaner

J-2 For cleaning or sanitizing in confined areas where fumes, smoke, flame, or excess water are objectionable or hazardous, the Model E-350 Hy-pressure Jenny by **Homestead Valve Manufacturing Company**, Corapolois, Pa., is designed for average light to medium duty cleaning.

Start - up procedures (motor switch, heaters and setting solution concentration metering valve) take only 90 seconds. Safety features include automatic shut-off in case of water supply failure, hose protector plug and valve to automatically release excess pressures if line restrictions occur.

Cleaner is available for either 220 or 440 volts, 3 phase, 60 cycle, a-c current. 375 lb unit can be easily moved on 7½" rubber-tired wheels.

Substation Transformers

J-3 The Modupac line of compact indoor substation transformers manufactured by **Westinghouse Electric Corporation**, Box 2099, Pittsburgh 30, Pa. has been extended to cover 112.5- and 150-kva ratings. These self-contained liquid power centers will continue to be made in the 225- and 300-kva sizes.

The standard modules of this line allow fast shipment and give the equipment greater flexibility since the modular components are interchangeable between units. In all four ratings, the transformer tank is braced for full vacuum, yet the size of each unit is small enough to pass through industrial doorways.

Pushbutton Actuators

J-4 New 12MA switch actuator series, manufactured by **Micro Switch,** Freeport, Ill., fits all pinplunger basic switches, and the company's ITB and 4ITB switches. Six catalog listings in the new series (two button sizes and three colors) allow selection from hundreds of company's basic switches to fit almost any pushbutton circuitry requirement.

Units available with red, green or black plastic buttons in ½ in. and 1 in. sizes. Switch mounting holes and actuator mounting bushings are adjustable for panel thicknesses of .060" to .312". Also, the adjustable switch mounting holes allow a user to position the basic switch for best button travel.

Aluminum Pipe

J-5 Reynolds H-E Pipe, the new thick-jointed aluminum pipe originated by **Reynolds Metals Company,** Dept. PRD-11, Box 2346, Richmond 18, Va. is now available in a complete range of Schedule 40 equivalent sizes.

The Schedule 40 equivalents are in addition to Schedule 80 equivalent sizes obtainable when the product was introduced last December.

The new sizes are being produced in response to requests from oil, chemical and processing firms which wish to extend the cost-saving features of "Reynolds H-E Pipe" to their operations.

The walls of "Reynolds Heavy-End Pipe" are tapered in thickness to provide extra strength at the joints while eliminating excess metal in the pipe body. Available in 30 and 40 foot lengths, it can be used interchangeably with other standard aluminum pipe.

Coming in October

12th Annual
BETTER PRODUCTION ISSUE Featuring
Case Studies from South and Southwest

The 1959 **BETTER PRODUCTION ISSUE** of S. P. I. will present specific instances showing how Southern and Southwestern Plants are getting better performance and production because of improvements they have made in:

Buildings & Equipment
Power & Steam Generation
Piping & Valve Systems
Electrical Systems & Controls
Power Transmission
Lubrication & Maintenance
Materials Handling
Industrial Water Systems
Air Conditioning
Heating & Ventilation
Lighting & Other Facilities
Instruments & Controls
Production Equipment
Manpower Utilization
Other Functions of Broad Interest

CASE STUDIES will show exactly how production has been improved in specific Southern and Southwestern Plants. While emphasis will be placed on increased production, related improvements such as equipment modernization, better maintenance, fewer rejects, reduced operating costs, etc., will be included as part of the overall **BETTER PRODUCTION THEME.**

THE OBJECT of the entire issue will be to present a large number of proven procedures and improvements that may be copied and put to work toward increasing output and improving performance of Southern and Southwestern Plants.

Start your subscription now and be sure of getting the important **BETTER PRODUCTION ISSUE** . . . take advantage of the special rate of two years for $3.00.

SOUTHERN POWER & INDUSTRY

806 Peachtree St., N. E., Atlanta 8, Georgia

I accept your invitation. You may enter my subscription to SOUTHERN POWER & INDUSTRY at your thrift rate of $3.00 for two years.

☐ Enclosed find $3.00 ☐ Send bill for $3.00

(Mailing address)
Name _____

P. O. Box or
Street and No. _____

City _____ State _____

Classification data—If an individual, give name of firm connected with and title of position.

Firm _____ Position _____

Products manufactured
or nature of business _____

New Product Briefs (Continued)

Variable Speed Drive

J-6 The first shaft-mounted, mechanical variable-speed drive to reach commercial markets is now available from **Sterling Electric Motors, Inc.**, 5401 Telegraph Rd., Los Angeles, Calif.

Shaft-mounting eliminates all intermediate transmission elements such as couplings and sprockets, allowing the unit to be mounted directly to the drive shaft.

This new Sterling drive has been designed for variable speed applications where space limitations dictate that the output shaft be at right angles to the transmission. It is especially adaptable to applications requiring controlled speed in a lightweight and compact power drive.

Available in drip-proof or totally-enclosed constructions, these one-quarter to three horsepower units feature speeds from 360 rpm to 5.2 rpm, and speed variations from 2:1 to 10:1. A wide variety of both electrical and mechanical modifications is available.

Power Plane

J-7 A new Power Plane is now being produced by the **Black & Decker Mfg. Company**, Towson 4, Maryland, that operates by direct drive (without gears) at speeds up to 21,000 rpm, to produce an extremely smooth, level finish.

The unit is designed for most comfortable operating balance. Handles and thumb-rest are so placed as to provide an accurate planing "feel" and afford the correct "inward and downward" pressure for each planning operation. The B&D Power Plane is engineered for continuous production service, with built-in features that include special Black & Decker Motor and lubricant-sealed ball bearings; fully adjustable cutting depth and edge guide for mitre-planing up to 45° inwardly (toward shoe) and up to 30° outwardly; and an exclusive "flat top" designed motor housing that permits standing the complete tool on end for quick, convenient depth or angle adjustment.

Cutting depth of the No. 19 Power Plane is 3/32" with a 2-1/16" cutter length. Shoe is 18-3/16" long. Powered by a Black & Decter 1 hp (maximum) Motor, the unit operates on standard 115 or 220 volt current, a-c or d-c. Standard equipment includes a 3-wire cable for grounding, heavy-duty toggle switch, straight-face cutter and arbor.

Roofing Material

J-8 The greatest advance in roof protection systems, trade named Tremglas, has been announced by **The Tremco Manufacturing Company**, 8701 Kinsman Rd., Cleveland 4, Ohio.

The new white glass membrane for renewing asphalt built-up roofs or for repair of tar and gravel roofs has exceptional strength. It's stronger than felt and meets the strength of jute but surpasses it in durability. Tremglas is a strong, flexible glass membrane, of continuous filaments, impregnated with an elastic binder and will not rot.

It's often difficult for mechanics to apply a uniform, sufficient coating over black felt or membrane. Tremglas has a natural luster-white color and the mechanic can see what he is doing. This permits him to apply a controlled, even coat over the entire area — avoiding bare spots or unnecessary puddling, which are easily recognized as contrasted to ordinary black mat. Simple to apply, Tremglas readily conforms to contours and uneven surfaces.

WANT INSTANT STEAM-?
SPEEDYLECTRIC
Battery of three Speedylectrics supply laboratory steam at a leading university.
THE ELECTRODE STEAM BOILER
Packaged STEAM GENERATORS
✔ For Process Steam whenever and wherever you want it, at the flick of a switch. High or low pressures... constant temperatures up to 470°F. Completely safe—no fire or explosion hazard.
✔ For Auxiliary Steam in remote areas or for off-hour operations where central boiler service would be too expensive.
✔ For Higher Pressure Steam—while permitting the main steam service to operate at low pressures.
Write for Bulletin SG-100
Pantex
Steam Generator Division
MANUFACTURING CORPORATION
P. O. Box 660 AX, PAWTUCKET 9, R. I.
9-299

Split-Body Valves

J-9 **Kieley & Mueller, Inc.**, 64 Genung St., Middletown, N. Y., has announced a complete line of split-body control valves for use in high-temperature, high-pressure control applications.

Chief features of the line are large flow capacities and face-to-face dimensions, permitting the complete interchangeability of the split-body line, not only with all regular K & M globe-body diaphragm valves, but with other standard makes. All major components . . . topworks, valve bodies, line flanges, plug and seat rings . . . are of unitized construction, making it possible to develop 432 different valve combinations from a single split-body, and enabling users to keep plant inventories to a minimum.

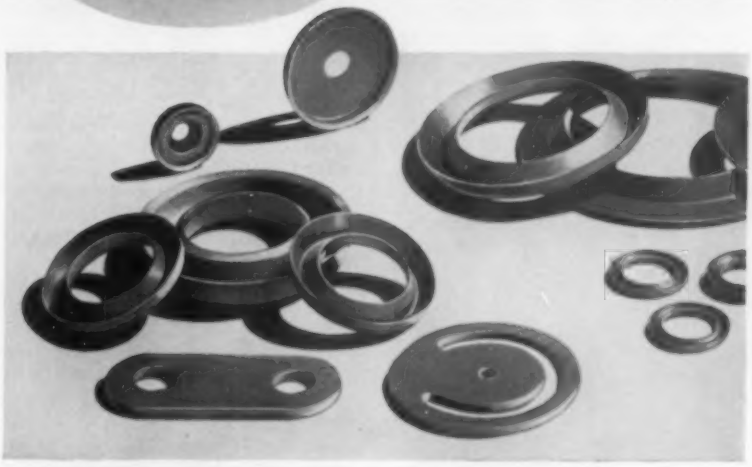
Cleaning Paint Passages

J-10 New, large capacity equipment for flushing and cleaning out the paint passages and hose lines in complex finishing equipment like automatic spray machines, paint heaters and multi-station systems is now available from **The DeVilbiss Company.**

The new units are available in two, five, ten and 15-gallon sizes and will clean hose, heater coils and flush spray guns in a single operation. A minimum amount of solvent is used and the operation is done quickly and effectively, the company states. The cleaners consist of a pressure feed tank shell, lid assembly, safety valve, and a new triple action cleaner and air mixer assembly.

MOST COMPLETE LINE

Eleven Product Groups Serve Every Sealing Need



GROUP NO. 5

Hydraulic Packings

OTHER BELMONT PRODUCT GROUPS

1. High Pressure Asbestos Packings
2. Valve Stem Packings
3. Rotary Pump Packings & Seals
4. Criss-cross Braided Packings
6. Bel-Vee V-Rings
7. Sheet Packings
8. Gaskets
9. Metallic Packings
10. Plastic Packings
11. Expansion Joints

Leather Packings—Cups, V-Packings, U-Packings, hat-packings, flange-packings, washers, gaskets, discs—in a choice of tannages, treatments, finishes and in all sizes to meet every hydraulic packing requirement.

Molded V-Ring Sets of cloth-inserted rubber, Neoprene, Teflon*, Kel-F†, for water, oil, new synthetic hydraulic fluids.

Spiral & Coil Packings—Twenty-five styles of duck and rubber, flax, rubber backed flax, channel flax, waterproof jute and ramie.

MOST CONVENIENTLY AVAILABLE

Nationwide Industrial Distributor Organization Provides On-the-Spot Service

There is a Belmont Packing for every sealing service. See your Belmont distributor or write for the one nearest you.

*du Pont Trademark
†M. M. & M. Trademark

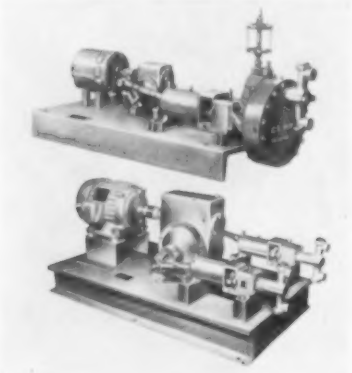
BELMONT

The Belmont Packing and Rubber Company
Butler & Sepviva Streets, Phila. 37, Pa.

New Product Briefs (Continued)

Controlled Capacity Pumps

J-11 **The Clark - Cooper Company, Inc.,** 300 Market St., Palmyra, New Jersey, has announced the production of a new line of controlled capacity metering pumps.



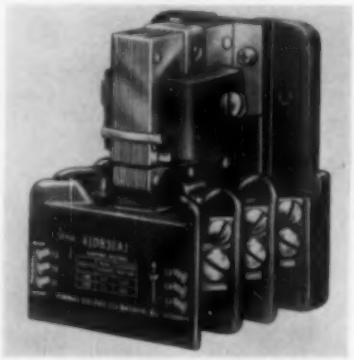
Designated "CC Pumps," the line includes both plunger-type and diaphragm-type metering pumps. Both types operate on the reciprocating action of a positive-displacement plunger. They differ in that the diaphragm pump has a hydraulically-balanced teflon diaphragm between the plunger and the pumped liquid. Unitized design of basic components permits conversion from one type of pump to the other by simply substituting liquid-end assemblies.

A distinct design innovation is the straight-column, drop-out construction of the liquid end. Free-floating ball-check valves, enclosed in precisely dimensioned cages, are stacked vertically within the liquid-end housing; this system gives improved flow characteristics and allows easy removal of the valves for cleaning.

Standard simplex models of CC Pumps range in capacity from one drop every 13 strokes to 1000 gph, at discharge pressures to 10,000 psi. Flow output for any given size pump is adjustable from 0 to 100 per cent capacity. Material specifications for wetted and non-wetted parts encompass a wide diversity of metals and plastics to allow selection of the proper pump.

Magnetic Controls

J-12 The Class 41 contactor line rated in 20, 30 and 40 ampere sizes for air conditioning and refrigeration, manufactured by **Furnas Electric Co.,** 1047 McKee St., Batavia, Ill., are also rated through 10 hp, 220 volts and 15 hp, 550 volts polyphase for across-the-line control of electric motors, heating and lighting loads. These same controls are also rated for resistance heating loads through 40 amperes.



These new Class 41 magnetic contactors have 550 volt ratings, compact design, replaceable contacts and coil, moisture resistant coil, pressure terminals, "no-kiss" potential solenoid, and many other features.

Collector Cleaner

J-13 Cleaning time on wet-type dust collectors has been cut from as much as 8 hours to a bare one-half hour out of each 40 hours of operation, according to actual case histories newly compiled by **The North American Mogul Products Company,** Standard Bldg., Cleveland 13, Ohio. The company produces a safe, non-toxic cleaner especially designed to keep wet-type dust collectors operating at peak efficiency.

A score of case history reports have been collected into a handy volume for distribution to interested users. These reports reveal how "Mogul" has greatly reduced cleaning time and eliminated manual scraping or wire brushing of wet-type dust collectors. "Mogul," the manufacturer reports, prevents hard deposits from forming, neutralizes acidity, removes corrosion deposits and protects against further corrosion. Further, it eliminates congestion, stops foaming and prevents clogging of discharge and sewer lines, the case histories show.

SURE PROTECTION
against WATER HAMMER

Architects and Engineers
Welton Becket, FAIA and Associates
General Contractor
J. W. Bateson Co., Inc., Dallas
Mechanical Contractor
Farwell-Wallace, Dallas

At the dramatic new Southland Center in Dallas, 57 Williams-Hager Silent Check Valves protect the plumbing, heating and air conditioning systems from surge pressures and resulting water hammer. Write for Bulletins: No. 654 on the Valves, No. 851 on Cause, Effect and Control of Water Hammer.

WILLIAMS-HAGER
Silent
Check Valves

THE WILLIAMS GAUGE CO., INC.
160 Stanwix Street
2 Gateway Center • Pittsburgh 22, Pa.
Our 73rd Year 1886-1959

Capacitor Switching

J-14 A new control for capacitor switching is now available from the **Westinghouse Electric Corporation**, Box 2099, Pittsburgh 30, Pa.

Enclosed in a Flexitest case, the new control contains an improved master induction disc relay which has a dual range of adjustment — one-half to one ampere and from one to four amperes. In addition, a var relay is used for the first time.

Two thermal plug-in-type fixed time-delay relays, one in the close circuit and one in the trip circuit, provide a predetermined time delay that eliminates unwanted switching operations from rapid system fluctuations of short duration. The fixed time-delay relays are in the circuit only during automatic operation.

To keep the capacitors connected and prevent unwanted switching operations, a new toggle relay is used, with which the oil switches remain closed and the capacitor bank remains connected when voltage is restored.

A low-voltage lightning arrester has been added to protect the circuit elements from voltage surges.

The external part of the Flexitest case contains a Quicklag circuit breaker for the incoming circuit and two selector switches — "automatic-manual" and "close-trip."

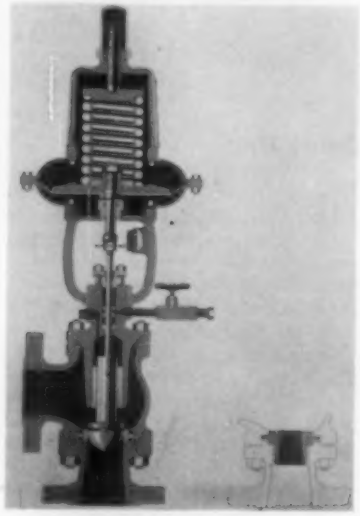
The entire capacitor switching control is enclosed in a weather-proof cabinet.

Control Valve

J-15 A new angle control valve with an improved venturi effect designed to reduce turbulence and cavitation in the control of slurries, viscous or flashing fluids has been developed by **Minneapolis-Honeywell Regulator Company**, Fort Washington, Pa.

Pneumatically operated, the valve has both a bolted tailpiece, permitting easy access to the clamped-in seat ring, and a bolted bonnet which permits plug and stem replacement without removal of the body.

Applications of the valve are expected to find a broad range in petroleum refining, chemical manufacturing, paper-making, and in the utility industry for steam generation, and in the treatment of water, sewage and industrial wastes.



A pneumatic diaphragm actuator provides air-to-open or air-to-close valve action. Valves are made of carbon steel and Type 316 stainless steel in sizes from one through six inches with body ratings to 600 lbs. They are available with full capacity or 40% capacity trim.

Relief Valves

J-16 Two new automatic temperature - pressure relief valves are announced by **Mansfield Sanitary, Inc.**, Perrysville, Ohio.

Designated as models 496 and 497, they protect against both excessive pressures and temperatures when inserted in either hot water lines or tanks. Thermo-setting element of each provides effective temperature relief action and assures immediate closing of the valve after a 10 degree drop in water temperature.

Unlike relief valves with fixed settings, all Mansfield models can be adjusted to relieve water at any pressure between 50 psi and 200 psi. Stainless steel control spring is said to assure instant relief whenever setting is exceeded.

No. 497 is identical to No. 496, except it is equipped with a combination test lever and adjusting key that fits exactly into the slot on the top of the pressure cap. By looking across the valve top and following figures marked on the lever, pressure can be quickly and accurately set.

Constructed with red brass bodies, Mansfield relief valves have Btu ratings of 150,000. Male and female outlets are both ½ inch. All are individually boxed, 48 boxes to a master carton.

Pneumatic Hose

J-17 The latest product of **Aeroquip Corp.**, Jackson, Mich. is 678 Hose of Teflon for 6000 psi pneumatic systems and with a 24,000 psi burst pressure. The rugged hose is designed for the more severe requirements of missile pneumatic charging systems. The 4 to 1 safety factor of the hose provides greater safety to crews handling very high pressure air, helium, nitrogen, and other gases.

The new hose has a Teflon tube with zero moisture absorption and an anti-adhesive surface. This permits fast, easy purging and dehydration of hose lines and equipment. Spirally-wound stainless steel wire overlaying a stainless inner braid reinforces the hose, which has a stainless braided cover.

Babbitt

Adjustable
SPROCKET RIM
with Chain Guide
Changes that Danger Zone to a
SAFETY ZONE

The distance between the floor of your plant and your overhead valves is a DANGER ZONE when piled up boxes or even ladders are used to reach the valves.

Turn it into a SAFETY ZONE — equip your overhead valves with Babbitt Adjustable Sprocket Rims with Chain Guides.

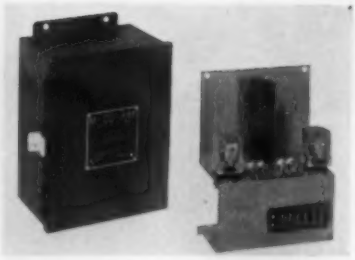
- They simplify pipe layout.
- They fit any size valve wheel.
- They are easy to install and operate.
- They operate any valve from the floor.
- They save time and money.
- The first cost is the only cost (no maintenance).
- They are packed completely assembled (one to a carton), with easy-to-follow instructions.
- A hot-galvanized rust proof chain is available for all sizes.

Babbitt Adjustable Sprocket Rims with Chain Guide are carried in stock by most mill supply houses. If your supplier does not carry them, contact us direct.

Babbitt
STEAM SPECIALTY CO.
3 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

168-9

New Product Briefs (Continued)



Delay Unit

J-18 New Delay Units designed to prevent the closing of gas valves during momentary periods of voltage-drop have been introduced by **Michigan Controls Co.**, 8790 Grinnell Avenue, Detroit 13, Michigan.

Marketed under the name "M-Co-Pak," these units will keep fuel shut-off valves open for a five-second period in the event of power fluctuation or failure caused by thunderstorms, power changeover and the like. Valves re-setting time is eliminated; production schedules can be maintained; scrapping of improperly treated materials is often prevented.

"M-Co-Pak" is available in three basic models: Model "A" operates on 440-volt, 220-volt or 110-volt, 60-cycle current and is ideally suited to most industrial gas furnace requirements. Model "B" incorporates an additional interlock for use with other types of safety devices. Model "C" is designed for use with flame safety controls and permits a greater variety of combinations for maintaining external circuits.

Longer time-delay periods can be furnished on all models upon request.

Electric Drills

J-19 Two new series of Thor portable electric SpeedDrills in ¼-, 5/16-, and ⅜-inch capacities have been introduced by the **SpeedWay Division of Thor Power Tool Company**, 1421 Barnsdale Rd., LaGrange Park, Ill.

The new Thor heavy-duty 1200 Series is for constant-use applications requiring industrial-rated tools. The series has sealed anti-friction ball and needle bearings and heavy-duty two-pole switch with locking pin.

The Thor standard-duty 1300 Series has anti-friction, oilless ball bearings on armature and spindle, and UL-approved momentary contact switch with locking pin. These drills are designed for tasks in which the operation is not continuous.

All new Thor SpeedDrills are lightweight and compact, with weight of the various models only 4½ pounds and overall length varying from 9 to 9⅝ inches, depending upon chuck capacity. Universal series-wound motors provide the power in both series and the drills have 10 feet of 3-conductor, UL approved lead cord.

Heat Transfer Unit

J-20 Platecoil Div., **Tranter Mfg., Inc.**, Lansing 9, Mich. has introduced "Platecoil," a heat transfer unit made of two sheets of embossed metal welded together to form passages for heating and cooling media. It replaces pipe coil in industrial heating and cooling applications.

The new product has a branched inlet that carries steam or other media directly to all portions of the "Platecoil" so that more uniform distribution of heat is achieved. A patented design that has been tested at operating pressures of 250 psi with a 5 to 1 safety factor, the new unit is expected to broaden the fields of application for the Tranter heat transfer unit.

Automatic Charger

J-21 A completely automatic charger for electric industrial truck batteries, which rides around right on the battery itself, has been introduced by **Exide Industrial Division** of The Electric Storage Battery Company, Rising Sun & Adams Ave., Philadelphia 20, Pa.

The silicon-rectifier device, with a brainy transistorized control unit, need only be plugged into a handy 115-volt, a-c wall outlet to charge the battery right in the truck. No further attention or additional equipment is needed.

The unit is designed for use in one-shift operations with six-cell batteries — the size used widely for electric hand trucks.

Exide Power Mounts come in three single-circuit models, for batteries with capacities of up to 360-, 450-, or 660-ampere-hours.

Steel Check Valves

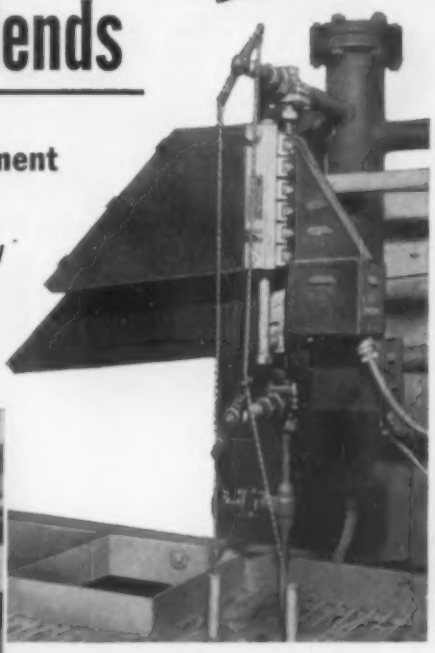
J-22 A new line of CPV steel check valves designed for high temperature hot water service has been announced by the **Combination Pump Valve Co.**, Dept. 232, 851 Preston St., Philadelphia 4, Pa.

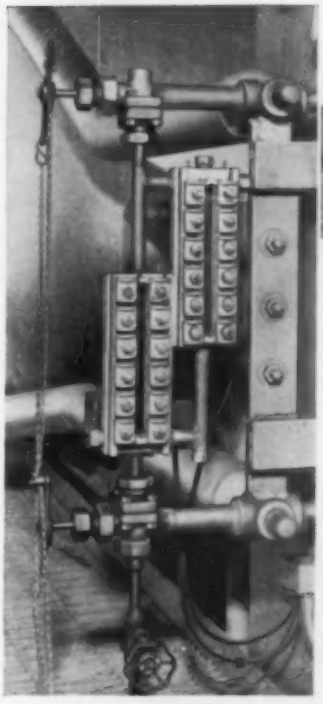
As soon as the forward flow of the fluid ceases, the spring actuated valve closes automatically thus eliminating surge, hammer and dangerous backdrop. The valves work equally well at all fluid temperatures and are available for pressure ratings ranging from 150 psi to 2500 psi.

Easily installed in any position, these valves provide a large flow area in excess of pipe diameter, which reduces fluid velocity across the valve seat and minimizes head loss. The stainless steel valve disc is center guided above and below, thus assuring a balanced lift, which greatly reduces wear and permits rapid, positive valve seating. In addition, the stainless steel spring is engineered to close the valve at the instant forward flow stops, thus eliminating reverse flow and the possibility of shock or slam.

Boiler Water Level Security Pays Dividends

... Reliance Equipment insures safe, sure supervision for low or high pressure plants





"Two water gages on all boilers operating at over 400 psi" says the code. Here's an example, in the municipal light and power plant of Coffeyville, Kans., illustrating modern Reliance 900 psi equipment.

Water column includes whistle alarm; is equipped with flat glass gage insert, periscope hoods to reflect image through cat-walk opening to a floor-stand mirror below; and mercury lamp illuminator for sharp, brilliant projection. The second gage, also of double-window flat glass construction, is custom-made with tie-bar, for direct-to-drum installation.

Reliance builds for all pressures — brings you a complete line of boiler safety devices. The long record of efficient, dependable service — the extra margin of safety built into all Reliance Equipment — assures long life and low maintenance. Check with your consultants or ask for nearest Reliance Representative address.

The Reliance Gauge Column Co.
5902 Carnegie Avenue • Cleveland 3, Ohio

The name that introduced safety water columns....in 1884

Reliance®

BOILER SAFETY DEVICES

SET IT DOWN!
HOOK IT UP!

ILLCO-WAY
ionXchange
EQUIPMENT

COMPLETE AUTOMATIC DE-IONIZER

Here is a complete, loaded, fully-instrumented, *automatic* ionXchange unit in a neat, compact, and *ready-to-operate* "package." It is equipped with our own Illco/Matic, all-plastic, air-actuated valves, which have been specially developed for ionXchange service. The Control Panel, also our own design and manufacture, provides all necessary quick-adjustment features, and requires only electrical hook-up to the terminal box on the frame. The only other connections required are to plant service.

FULLY ASSEMBLED AND READY TO INSTALL

All structural assembly of elements, all piping, all wiring, and all installation of air lines is done in our factory by men of long experience. Then the unit is tested for proper operation of all circuits, loaded with the proper supporting beds and resins, painted, bolted to a skid, and crated for delivery to the exact spot it will be used. *This is the quickest, easiest, and surest way for you to get a reliable, ready-to-go ionXchanger* — arranged and instrumented to suit your special needs, whatever they are.

Write for Particulars

ILLCO-WAY
ILLINOIS WATER TREATMENT CO.
840 Cedar St.
Rockford, Ill.

NEW YORK OFFICE: 141 E. 44th St., New York 17, N.Y.
CANADIAN DIST.: Pumps & Softeners, Ltd., London, Can.

Limit Switch Arm

J-23 A new adjustable limit switch arm, designed for use on conveyors, machine tools, and various types of automation equipment, has been developed by **Square D Company**, 4041 N. Richards St., Milwaukee 12, Wis. The length of the arm may be varied to fit any specific application, permitting the switch to be mounted safely out of the path of moving pieces.

Built for use on Square D Type T heavy duty limit switches, the new arm is made up of three pieces. The roller portion fastens to a length of ¼" key stock, which in turn is inserted into the section fastened to the switch. The key stock may be cut to any desired length.

Tractor-Shovel

J-24 **The Frank G. Hough Co.**, 878 Seventh St., Libertyville, Illinois, has announced the addition of a new Model H-120 to its line of rubber-tired, four-wheel-drive "Payloader" tractor-shovels.

The maximum height of raised bucket is 19'2½" with clearance to center of hinge pin, 14'7½". With the bucket dumped at 50°, clearance under the bucket is 10'10" and the forward reach from the front tire is 3'6".

This newest "Payloader" is powered by a turbo-charged Cummins NRT-6-BI diesel engine which develops 300 hp at 2,100 rpm. Optional engines will be available in the near future. Standard unit is equipped with 26.5 x 25, 14 ply tires.

The manufacturer's recommended load "carry capacity" is conservatively rated at 12,000 lbs. Buckets from 3 to 6 cubic yards are offered for handling various materials where the total load weight falls within the "carry capacity" range.

For digging operations, the H-120 has a tremendous break out force of 26,000 lbs, and the bucket can be tipped back 40° at ground level. As the boom arms are raised, this tip back continues to a maximum of 75° thus placing the load in a flat, horizontal position which reduces to a minimum the amount of spillage.

The H-120 features a four-speed, forward and reverse, power-shift transmission and matched torque-converter which provides travel speeds up to 28 mph. The filtered hydraulic system is closed and pressure-controlled. Both air brakes and power-steering are standard. Dual foot pedals give the operator a choice of braking with transmission engaged or disengaged.

Non-Interchangeable Circuit Breakers

J-25 Non-interchangeable circuit breaker, manufactured by **Wadsworth Electric Mfg. Co., Inc.**, Covington, Ky., prevents substitution of a higher ampere breaker for a lower ampere breaker, when the enclosure was originally wired for the lower ampere breaker. In this manner various electrical hazards, fires, etc., are eliminated.

Enclosures are equipped with breaker support channels which are punched and coded for easy custom blocking by the installing electrician.

Breakers are divided into two classifications — first, 0 to 20 ampere, single and double pole; and second, 21 to 50 ampere, single and double pole.

Relief Valves

J-26 **A. W. Cash Valve Mfg. Corp.,** 666 E. Wabash Ave., Decatur, Ill. has announced a new series of Temperature Pressure relief valves for water heaters. Designated CASH-ACME Type NV Series, the valves feature a new patented thermostatic element, with no fluids to leak out. The valves automatically close tightly after relieving because of temperature or pressure increases.

Heavy cast bronze bodies, the Type NV Series are available with or without test levers, with or without 6" stems, and in ½" or ¾" male inlet connections. Valves are available with relief settings from 50 to 200 psi.

Miniature Spray Gun

J-27 Mini-Rod is another of the new guns released by **Eclipse Air Brush Company,** 390 Park Ave., Newark 7, N. J. The new hand gun is lightweight and versatile, ideal for light products finishing and touch-up operations.

The Mini-Rod features a finger tip snap action which adjusts the fan control for either of two adjustable spray patterns.

Equipped with a four-ounce syphon cup, the new model may also be used from a tank for pressure feed. The plunger is removable and may be adjusted for wear without the use of tools or disturbance of any other parts.

(*Continued on Page 98*)

OSCILLATORS
AIR CIRCULATORS
EXHAUST

FANS

BY EMERSON-ELECTRIC

low initial cost
low operating cost

You save money when you install quiet, efficient fans — oscillators, air circulators and both belt-drive and direct-drive exhaust fans — backed by the Emerson-Electric famous factory-to-user guarantee.

WRITE FOR FREE CATALOG NO. F290

EMERSON ELECTRIC of St. Louis • *Since 1890*
8100 FLORISSANT AVE. • ST. LOUIS 21, MO.

NEW Catalogs & Bulletins

. . . there is always a BETTER WAY

MAINTENANCE—TOOLS EQUIPMENT & METHODS

2—Electrical Maintenance—New contract service (for Southeast only) inspects and tests motors, generators, gearing, control & distribution systems, etc., at a cost less than 1% of value of equipment. — Atlanta office of WESTINGHOUSE ELECTRIC.

5 — Metal Cutters — Bulletin 655 shows actual cost figures on various metal cutting jobs (bolt, rod, wire, chain, etc.), by using hand and power-operated cutters. — H. K. PORTER INC.

17—Mechanical Packings—32 p Cat. PC-103 describes a variety of packings & gaskets, including self-lubricating, sheet and molded packings, etc. Includes application charts and price information. — GREENE, TWEED & CO.

20—Lubrication Manual — Selection & application of right lubricant for 560 lubricated plug valve applications featured in 12 p manual. Service and temperature ranges tabulated. — WALWORTH COMPANY.

23 — Boiler Gaskets — Catalog describes wire-inserted woven asbestos and spiral wound metal-asbestos — for manholes, handholes and tube caps of all makes of stationary and marine boilers, water walls, economizers, etc. — THE BELMONT PACKING & RUBBER CO.

31 — Stack Maintenance — How wrought iron offers unique defense against flue gas corrosion described in bulletin "Wrought Iron for Flue Gas Conductors."—A. M. BYERS COMPANY.

32 — Scale Removal — Data sheet on Kwik-Kleen, a completely safe method of rapid scale removal for heat transfer surfaces.—THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

45—Correct Lubrication — "Lubriplate Data Book" shows importance of providing and maintaining proper and economical maintenance of all types of plant machinery thru adequate lubrication. — FISKE BROTHERS REFINING CO.

53—Steam Line Treatment — Folder describes alkaline IPCO S-L-T. Used in boiler water, it will volatilize and travel with steam to return lines. Prevents costly repairs and provides insurance against replacing pipe and fittings. — IPCO LABORATORIES, INC.

58—Tube Expander Drives — Bulletin 581 gives data on complete line of Torq-Air-Matic automatic tube expander drives and explains the importance of precision control in tube expanding. Chart to aid selecting right model for the right job. — THOMAS C. WILSON, INC.

64 — Anti-Corrosive Paints — Bulletin "The Application of Subox and Subalox Paints" — Gives the story of a complete paint system for weather, moisture and alkali protection, with details as to application.—SUBOX, INC.

70—Multi-Purpose Grease — Bulletins describe new single product Gulfcrown grease (4 consistencies) that does the work of many—simplifies application and avoids errors, reduces inventory and cuts lubrication costs; grease gun or centralized system application. — GULF OIL CORPORATION.

78—Control Heat & Glare — New folder tells how Sun-X Glass Tinting (transparent alkyd-based liquid plastic by duPont) is applied directly to existing glass by flow process without spray or splatter. Bonds tightly. Wash in usual manner. — AMERICAN GLASS TINTING CORP.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

108—Fans—Cat. F285 describes company's fans — oscillators, air circulators and both belt-drive and direct-drive exhaust fans. — EMERSON ELECTRIC.

110 — Deaerator — Publ. 4651 describes design that eliminates tubular vent condensers without impairing efficient purging of non-condensible gases. Unit handles wide range of operating conditions. — COCHRANE CORPORATION.

122—Industrial Fans—Bulletin 702 covers Type XL fans for air and material handling. Volumes to 130,000 cfm pressures to 18" SP. Catalog 855 describes Pressure Fans. Volumes to 12,000 cfm, 10" to 50" SP. — CLARAGE FAN CO.

132—Glassed Centrifugal Pumps — 12 page Bulletin 725.2 describes line of glassed pumps for handling corrosive acids and alkalies. Every part of pump exposed to liquid has a tough glass surface. Specifications, ratings, dimensions. — GOULDS PUMPS, INC.

135—Heat Exchanger — Bulletin 132 shows how sectional Aero unit gives close temperature control, saves labor, power, and water; design improves heat transfer to outdoor air by evaporation; 7,000,000 to 18,000,000 Btu/hr capacity range. —NIAGARA BLOWER COMPANY.

143—Chemical Feeders — 36 p Bul. 1136 describes metering pumps — types, construction, dispacement and operating pressures. Gives handling recommendations for chemicals, acids, etc., and volumetric conversion tables. — MANZEL.

152—Stainless Steel Pump — Bulletin 725.4 describes pump for economical handling of hot, corrosive or abrasive liquids; 9 sizes with capacities up to 72 gpm; heads to 200 ft. — GOULDS PUMPS, INC.

160—Boiler Feed Pumps—12 p Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included.—PACIFIC PUMPS, INC.

189—Air Traps — Bulletin 289 describes ball float traps for draining water from air, gas or steam lines, or for draining light liquids from gas under pressure. Physical and selection data, prices, etc. — ARMSTRONG MACHINE WORKS.

192—Induced Draft Fans — Catalog 905 describes the new Type DN

INFORMATION CENTER

BOOKLETS • NEW PRODUCTS • ADVERTISEMENTS

Use Your SPI Postage-Paid Reply Card to Order Free Literature and Information

SEPTEMBER, 1959

Send me these FREE Catalogs and Bulletins . . . Fill in numbers

_____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____

I want details on these New Products . . . Fill in numbers

_____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____

Send more information on following advertisements

Company_____ Page____ Company_____ Page____
Company_____ Page____ Company_____ Page____

My Name .....*Position*.....
Company Name .....
Street .....
City .....*Zone*.....*State*.....

SEPTEMBER, 1959

Send me these FREE Catalogs and Bulletins . . . Fill in numbers

_____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____

I want details on these New Products . . . Fill in numbers

_____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____
_____ _____ _____ _____ _____ _____

Send more information on following advertisements

Company_____ Page____ Company_____ Page____
Company_____ Page____ Company_____ Page____

My Name .....*Position*.....
Company Name .....
Street .....
City .....*Zone*.....*State*.....

New Ideas...

New Equipment...

New Methods...

Keep up-to-date

With Your SPI Service Cards

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 582, SEC. 34.9, P. L. & R., ATLANTA, GA.

Reader Service
SOUTHERN POWER & INDUSTRY
806 Peachtree St., N. E.
Atlanta 8, Ga.

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 582, SEC. 34.9, P. L. & R., ATLANTA, GA.

Reader Service
SOUTHERN POWER & INDUSTRY
806 Peachtree St., N. E.
Atlanta 8, Ga.

Bulletins (Cont.)

Dynacurve fans offering minimum floor space & height requirements, and high efficiency over wide performance range. — CLARAGE FAN COMPANY.

INSTRUMENTS—METERS CONTROLS—REGULATORS

200—Control Centers—Built to specific needs of the job to prevent costly breakdowns later. Units custom-built from best components. Specializing in quick deliveries. — THOMAS B. COMBS COMPANY.

201—Valves & Gages—Handy guide No. 36 gives data & prices on valves, liquid-level gages & accessories for process and power industries. — PENBERTHY MFG. CO.

205—Draft Gages — Bulletins describe inclined, vertical tube, air filter gages, straight line and dial pointer type, minified draft and receiver type gages, velocity gages and pitot tubes, gas analyzers and steam calorimeters. — ELLISON DRAFT GAGE CO.

206—Process "Indicator"—Cat. 100 B shows how you can have maximum info on all process variables with Panalarm annunciators. Trouble anywhere is signalled instantly — before it can grow big and expensive. — PANELLIT, INC.

209—Liquid Level Controls—Catalog describes controls for almost any liquid, at any pressure, at any temperature. Can be furnished in top-mounting, side-mounting styles, or as external float cage units. Almost unlimited application. — MAGNETROL, INC.

235—Liquid Levels — Bulletin 532 describes indicator which gives a reliable, automatic reading of storage tank contents. 20" dial in 3 x 10" case saves panel space. No outside power source needed; can be located up to 250 ft from tank. — THE LIQUIDOMETER CORP.

279—Instrument & Control Panels—16 p Product Specification G71-7 gives details of construction, dimension, weights, instrument mounting, and accessories for 6 standard styles of instrument and control panels.— BAILEY METER CO.

281—Control Valve—8 p Bul. J-170 describes sliding gate and plate control valves available. Includes engineering data, cutaway drawings, features, application information, dimensional drawings, flow capacities, rating charts, flow curve and sample specifications. — OPW-JORDAN.

286—Feedwater Regulator — Bulletin 1055 describes the Flowmatic Type P feedwater regulator, applicable for marine or stationary service. Gives mechanical description of components and schematic diagram showing suggested piping arrangemen. Also specification table. — COPES-VULCAN DIV.

293—Metering & Control Systems—4 p Bulletin 500 discusses pneumatic and electric telemetering. Includes pneumatic control and detailed literature references for all products making up metering and control systems. — BAILEY METER CO.

PLANT CONSTRUCTION—WELDING EQUIPMENT—SPECIALTIES

300—Fact Folders — 23 up-to-date industrial fact-file folders on aluminum, steel, copper, stainless steel, insulation, roofing and other industrial supplies immediately available from 9 Southern warehouses. — REYNOLDS ALUMINUM SUPPLY CO.

302—Aluminum Jacketing — Independent laboratory heat loss report proves jacketing saves money for power plants by increasing efficiency of any insulation. Cost is less than canvas and paint. As a bonus you get a better looking plant and easier housekeeping. — CHILDERS MANUFACTURING CO.

310 — Incinerator — Metal cased, insulated, refractory lined incinerators for industrial and commercial use. City smoke code approved. Fast, economical installation — any size and capacity. — NORTH STATE PYROPHYLLITE CO.

315—Pressure Vessels — Catalog 100 discusses your plate fabrication problems and shows how company custom-fabricates hot water storage heaters, tanks, air receivers, blow-off tanks, etc. Corrosion resistant linings and materials featured. Suggested specifications and other valuable technical data given. — J. J. FINNIGAN CO.

323—Mercury Vapor Fixture — Industrial color corrected units described in Bulletin 401. "Stabilux Socket" secures bulb end of lamp, eliminating lamp rupture and breakage from vibration. — WIDE-LITE CORP.

327—Steam Fan Heater — Bulletin 109 discusses heater design which makes full use of all latent and sensible heat in steam up to 200 lbs without requiring expensive piping and pressure reducing stations. Applicable to large plant heating or process. — NIAGARA BLOWER CO.

334—Storage Racks — Bulletin 17SP shows how Rackmaster Fittings cut rack-building time as much as 60% by eliminating threading and welding. Pipe 100% salvageable. — THE HOLLAENDER MFG. CO.

355—Steam-Jet Cleaners — Bulletins JC-100 and SG-200 describe steam - jet cleaners. Series "R" Speedylectric generates steam to 250 psig and temperatures to 405 F. Larger cleaners available. — PANTEX MFG. CORP.

386—Rigid Frame Buildings—8 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bow-string truss all-steel roof systems; fabricated for rapid erection. — ATLANTIC STEEL COMPANY.

PIPING—VALVES—FITTINGS STEAM SPECIALTIES—TRAPS

407—Piping Materials—Bulletin reports on intensive investigation into problem of main steam piping materials and gives data on stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints. — PITTSBURGH PIPING AND EQUIPMENT COMPANY.

412—Power Piping — 8 p brochure describes latest computer methods of analyzing power piping designs. — THE M. W. KELLOGG CO.

416—Control Valves—Illustrated Cat. 305 contains detailed specifications on air-operated control valves. All usual types are described. Technical data are included as an aid to selection. — MASON-NEILAN DIV.

419—Small Gate Valve — Multiple applications of small forged steel gate valve noted in Catalog 10. Low maintenance. Sizes from ¼" to 2"; rising stem with yoke or rising stem with inside screw; Pressures from 380 psi at 1000 F to 2000 psi at 100 F. — THE CHAPMAN VALVE MFG. COMPANY.

422—Welded Steel Pipe — 40 p catalog describes application, advantages, standard specifications, production limits, linings and coatings, fittings, joints, etc., of welded steel pipe. Data tables, drawings, and illustrations included. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

465—Water Hammer — Cause, effect and control covered in Bulletin 851. — THE WILLIAMS GAUGE CO., INC.

472—Desuperheater — Bulletin 1056 describes a carburetor type desuperheater capable of being controlled to supply steam at a temperature within plus or minus 5 F or plant requirements. Includes struc-

Bulletins (Cont.)

tural details, system arrangements of control components, and mechanical specifications. — COPES-VULCAN DIV.

475—Check Valves — How W-H Silent check valves can protect plumbing, heating and air conditioning systems from surge pressures and resulting water hammer described in Bulletin 654. — THE WILLIAMS GAUGE CO., INC.

484—Threading Wrought Iron Pipe— A service manual which discusses in detail the proper threading of wrought iron pipe, both from the theoretical and practical standpoints. Illustrated with many helpful views. — A. M. BYERS COMPANY.

493—Unions & Valves — Complete company line of pipe unions and check valves covered in Catalog 56. New Four-Star lug nut unions & spring controlled check valves included. — CATAWISSA VALVE & FITTINGS COMPANY.

BOILERS—STOKERS TURBINES—BURNERS

505—Refractories — Paco High Heat Duty and Super Duty Plastic Refractories. Fire brick, high temperature cement, castables. Installation and engineering service. Free estimates and inspection. — NORTH STATE PYROPHYLLITE CO.

509—Free Coal Counseling — General information on how Coal Bureau engineers will advise on selection, transportation and utilization of the right coal for your purpose.—NORFOLK AND WESTERN RAILWAY.

511—Feedwater Treatment — Bulletin describes liquid and dry (Braxon & Flako) boiler feedwater treatment recommended for removal and prevention of scaling and corrosion during use of many types of water and for prevention of foaming and carryover. — ANDERSON CHEMICAL CO.

521—Gas Tempering — How you can burn the most economical fuel available (coal, oil or gas) described in Bul. G-96. Cuts overall plant costs since smaller size unit requires smaller building per kw, etc.—THE BABCOCK & WILCOX CO.

526 — 2-Pass Automatic Boilers — Bulletin tells how Continental packaged boiler design cuts down on inspection and maintenance costs and keeps down time to a minimum. — BOILER ENGINEERING & SUPPLY CO.

530—Coal Plant Specifications — 64 page brochure, including 5 drawings, is a comprehensive guide for preparing specifications on coal-fired, low-pressure heating plants in the size range of 750,000 to 5,500,000 Btu/hr. All aspects affected by choice of fuels from storage bin to stack design covered fully. — BITUMINOUS COAL INSTITUTE.

534—Package Generator — Model AA generator has new low pressure air atomizing oil burner, which cleanly and uniformly burns all commercial grades of oil (No. 4 with little or no preheat) for more efficient, economical firing. Many other new features. — AMES IRON WORKS, INC.

539—Industrial Burners — How to keep heating costs low with Hev - E - Oil commercial - industrial burners described in literature SPI-859. Models from 5 to 150 gph; automatic, electronic controls; Hev-E-Duty power gas burners and combination gas/oil burners from 720,000 to 21,000,000 Btu. — INDUSTRIAL COMBUSTION, INC.

KEEP-UP-TO-DATE
USE SPI
READER SERVICE

542—Underfeed Stoker — Illustrated Cat. 401 gives complete data on double retort underfeed stoker built for heavy duty service in intermediate size range for boilers of 20,000 lb to 34,000 lb of steam/hr capacity.—DETROIT STOKER CO.

547—Gas and/or Oil Burners — Bulletin B1 describes large or small, single or dual fuel, packaged or field assembled, atmospheric or forced draft; electronics of all types; competent sales and service. — WEBSTER ENGINEERING CO.

557—Coal — Current brochure on "Prescription Coals." — A. T. MASSEY COAL CO., INC.

566—Packaged Combustion Unit — Completely piped, wired and tested factory assembly described in Bulletin B8/30. Has Kinetic gas burner, manual firing valve, automatic diaphragm gas valve and electronic combustion safeguard system incorporating RA680 cabinet. Available in 3 sizes with 8 capacities from 800,000 to 3,260,000 Btu/hr. — WEBSTER ENGINEERING CO.

568—Feedwater Control System — 8 p Bul. 530 gives advantages, principle of operation and typical diagrammatic drawings of the 3-element feedwater control systems. Photographs & chart reproductions. — BAILEY METER CO.

574—Packaged Generator — Bulletin 582 describes Vapormatic Coil-N-Shell Steam Generator for service requirements of 5 to 150 psig. Gives operation features and specification data. Available with gas, oil, and combination gas/oil fuel systems. — TEXSTEAM CORP.

575—Package Boilers — Modern self-contained units 15-600 hp described in Bulletin AD163. For steam, 15 lb to 250 lb or hot water. Operate with heavy oil, light oil, or gas. Fully automatic units for industrial and institutional use. — CLEAVER-BROOKS CO.

577—Combustion Control — 12 p Bulletin 510 illustrates and describes how company's combustion control systems are applied to four major makes of pulverized coal-fired boilers. — BAILEY METER CO.

583—Steam & Hot Water Generators — Booklet describes company's line of fifteen compact models from 18 to 500 hp (15 to 200 psi). Only five connections needed; no special foundation. — CYCLOTHERM DIVISION.

586—Boiler Controls — Bulletin C1 describes automatic combustion controls for gas fuel firing of boilers of all sizes. Complete pneumatically powered systems of both the positioning and proportioning type are illustrated. — WEBSTER ENGINEERING CO.

ENGINES—DRIVES POWER TRANSMISSION MATERIAL HANDLING

618—Casters & Wheels — Featuring "Lockweld" steel casters without a king-pin, Cat. C-57 describes full line of industrial wheels manufactured and distributed from Rome, Ga. plant. — THE FAIRBANKS CO.

622—Pneumatic Conveyor Systems — 4 page Bulletin P58G describes many types of pneumatic conveyor systems for handling bulk materials. — NATIONAL CONVEYORS CO., INC.

628—General Purpose Trucks—Catalog T-54 describes two wheel hand trucks and platform — a full line manufactured in Rome, Ga. plant to cover your material handling needs. — THE FAIRBANKS CO.

629—Longer V-Belt Life — 12 page Bulletin 20x6234C describes various types of V-belts and tells how to select and match them. Lists seven steps for correct installation and

hints for making them last longer. —ALLIS-CHALMERS MFG. CO.

638—Idlers—Bulletin 925 details the Permaseal Idler's development from laboratory to installation. Outlines Double Flexible Diaphragm Seal which keeps grease in and dirt out. — JEFFREY MANUFACTURING CO.

648—Belt Fastening Tools — Bulletins F-110 and F-111 — Describe new Flexco power tool wrenches and power tool boring punches, designed to speed up fastening of wide conveyor belts; and give recommendations on the use of various impact tools connected therewith.—FLEXIBLE STEEL LACING CO.

650—Vibrating Feeders & Conveyors — 96 p book covers company line of electric vibrating feeders and conveyors. Includes controls, installation methods, principles of operation and individual unit specifications.—JEFFREY MANUFACTURING CO.

661—D-C Crane Control — 8 p Bulletin GEA-6434 features precision hoist, bridge and trolley control systems. — GENERAL ELECTRIC CO.

WATER TREATMENT—HEATING & AIR CONDITIONING—DUST & FUME CONTROL—REFRIGERATION

701—Exhausting Corrosive Fumes—Bulletin 702-A shows how corrosive fumes can be exhausted with rubber, lead lined or specially coated fans. — CLARAGE FAN CO.

703 — Air Conditioning — Bulletin 122 describes and illustrates operation and suggests applications for air conditioning method that controls humidity to 1% rh and temperature to 1 F (up to 140 F) with accuracy, independent of moisture sensitive instruments. — NIAGARA BLOWER CO.

704 — Water Conditioning — Brochure describes company's engineering services — zeolite water softeners, filters and purifiers, modernized and rebuilt water softeners, aerators and degasitors and process and boiler water conditioning. — SOUTHERN WATER CONDITIONING, INC.

705—Test Your Tower—Bulletin offers simple, proved method by which you can determine how closely your actual tower performance measures up to specified performance. Particularly applicable to operations geared to temperature of process cooling water. — THE MARLEY COMPANY.

723—Dust Collection — Catalog describes mechanical and electrical systems which meet most rigid anti-air-pollution codes; low resistance fly ash collector which combines top efficiency with low draft loss for natural or forced draft installations. — BUELL ENGINEERING COMPANY.

727 — Algae Inhibitor — Algicide bulletin describes simple, effective and economical way to get rid of algae troubles in humidifiers, air washers, condensers, heat exchangers, and other systems where water is exposed to atmospheric contamination. — THE NORTH AMERICAN MOGUL PRODUCTS CO.

742 — Water Treating Equipment Guide — Bulletin 615 illustrates and describes the newest in manual and automatic zeolite water softeners, demineralizers & deionizers, dealkalizers, etc. Spray and tray type deaerating heaters and water treating chemicals also included.—ELGIN SOFTENER CORP.

771—Water Treatment — 4 p brochure points out company's 8-point water treatment coverage for elimination of scale, sludge, corrosion and impure steam. — IPCO LABORATORIES, INC.

KEEP-UP-TO-DATE

USE SPI

READER SERVICE

ELECTRICAL

806—Motor Control — Condensed price catalog lists commonly used motor control up to and including Size 4 rating, plus push buttons, limit switches and other accessories. — ALLEN-BRADLEY CO.

809—Capacitor Selection Guide — 6 p Folder GED-3687 gives tables for choosing proper ratings of switched shunt capacitors for modern induction motors. Covers motors of all standard types, enclosures, and nominal speeds, 220-4000 v, 2-500 hp. —GENERAL ELECTRIC CO.

820—Electrical Maintenance — New contract service (for Southeast only) inspects and tests motors, generators, gearing, control & distribution systems, etc., at a cost less than 1% of value of equipment.—Atlanta office of WESTINGHOUSE ELECTRIC.

871—Electrical Protection — Protection Handbook — Tells how to protect motors, apparatus and circuits. Gives National Electrical Code requirements in simplified form. Designed to help the electrical or plant maintenance engineer. — BUSSMANN MFG. CO.

874—High Voltage Rubber Cables—32 p catalog contains information on design features, insulations available, and performance highlights of company's butyl rubber power cable, Durasheath. Also data on kinds of available constructions from 600 v to 15,000 v conductors.—ANACONDA WIRE & CABLE CO.

889—Transformers — Open dry-type units, rated 300 kva and above, 15 kv and below to meet general industrial requirements described in Bulletin GEA-6668. Three types of high-voltage terminations. — GENERAL ELECTRIC.

894—Control Cable — Bul. DM 5844 gives full technical data on thermoplastic all-purpose control cable with polyethylene insulation, double Densheath (PVC) jackets. — ANACONDA WIRE & CABLE CO.

W-1—Truck Operators' Training—20 p Instructors' Manual to be used as a guide for Industrial Truck Operators' Training Program. Booklet divided into 6 stages: theory of operation, good driving practices, details of construction in principal types of trucks, practical operation of truck, demonstration & written examination for driver trainee. — AUTOMATIC TRANSPORTATION CO., 149 W. 87th St., Chicago, Ill.

W-2—Urelite Circuit Breakers — 8 p Bulletin S-4261-2B describes engineering advances incorporated in new Urelite individually enclosed low-voltage power circuit breakers and enclosures and provides complete application data for contractors, distributors, consulting and application engineers and purchasing agents. — I-T-E Circuit Breaker Co., 1900 Hamilton St., Philadelphia 30, Pa.

W-3—Aerosol Products — Handbook "Aerosols for Industry" describes company's complete line of aerosol products — 47 maintenance and production aids in self-spraying containers. Includes color code enamels and marking paints, standard equipment finishes, special lubricants, protective coatings and degreasers. Also features Jet-Pak sprayer, a re-use self powered spray gun. — SPRAYON PRODUCTS, INC., 2075 E. 65th St., Cleveland 3, Ohio.

W-4 — Light-Heavyweight Machine Tools — 48 p Catalog WT-50-9 describes company's complete line of light-heavyweight machine tools and accessories. Includes specifications, catalog listings and descriptions of accessories for all tools. Photo & drawings. — ROCKWELL MFG. CO., WALKER-TURNER POWER TOOL DIV., Dept. 1009, 400 N. Lexington Ave., Pittsburgh 8, Pa.

(*Continued on Page* 96)

Bulletins (Cont.)

W-5—Solid Front Gages — Brochure 500SF describes the 4½, 6, and 8½ in. diameter gages — both flush and surface mounted — which are offered with safety-back, solid-front construction. Gives complete construction details with diagrams and photos. Includes gage specifications, materials of construction, standard graduation, types of cases and rings, gage dimensions, and weights. — CROSBY VALVE & GAGE CO., Wrentham, Mass.

W-6—Equipment Catalog — 68 p Catalog 596 describes company's line of materials handling, parts handling and power rectification equipment. Gives data and specifications on all company products. Illustrated. — SYNTRON CO., 118 Lexington Ave., Homer City, Pa.

W-7—Arc Welding — Data card, TDC-155, indicates proper type of electrodes to be used in arc welding and provides information on suggested pre-heat and post-heat treatments. Of benefit to fabricators who are confronted with the problem of joining tubing of similar or dissimilar types of steel. — BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV., Beaver Falls, Pa.

W-8—Dry Dust Collector — Bulletin 291A describes the characteristics and operation on the Amerclone dry centrifugal dust collector. Sizes range from 3-cell units (9,000 cfm) to 24-cell units (27,000 cfm). Illustrated. — AMERICAN AIR FILTER CO., INC., Dept. PD, 215 Central Ave., Louisville 8, Ky.

W-9—Plant Waste Disposal — Brochure describes Somat Waste Disposal System which takes in refuse, garbage & paper waste, chews it instantly into finely ground, compacted pulp, renders it odorless without the use of chemicals, and discharges it to haul-away containers for fast, easy disposal. — WANDEL MACHINE CO., Pomeroy, Pa.

W-10—Carbon Steel Pressure Tubing —Bulletin TDC-142B furnishes condensed data on the mechanical and physical properties of seamless and welded carbon steel pressure tubing, and supplies information on the various fabrication operations normally performed on such tubing. — BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV., Beaver Falls, Pa.

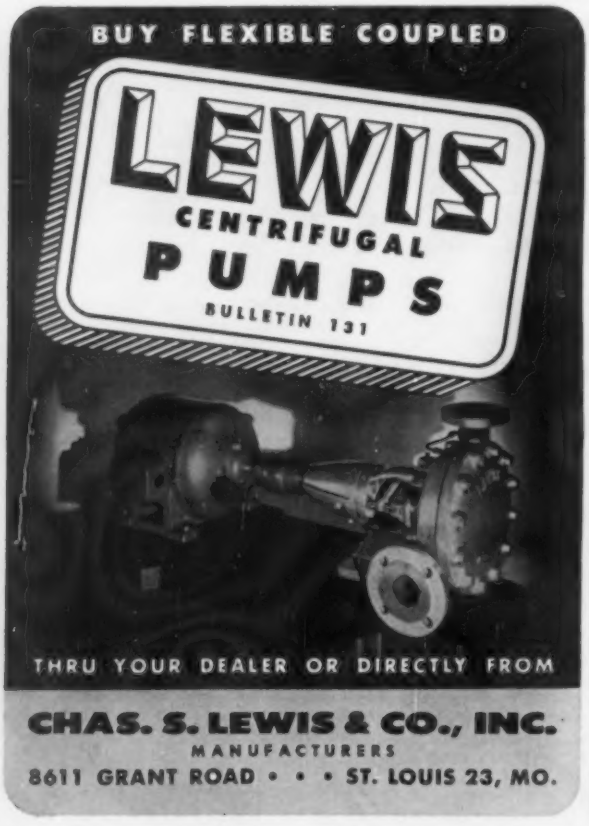
W-11—Use of Plastics — "Guide to Use of Plastics in Production, Maintenance and Safety Applications" gives helpful hints on proper storage and care of plastic sheets, rods and tubes in customer's own plant. In columnar form for quick selection of right type plastic for specific applications. — COMMERCIAL PLASTICS & SUPPLY CORP., 630 Broadway, New York 12, N. Y.

W-12—Compressors — 16 p Bulletin A-56 describes and illustrates Unitair compressors. Includes cross section drawings and a run-down on all vital components. — JOY MFG. CO., Oliver Bldg., Pittsburgh 22, Pa.

W-13—Sanitary Equipment — 20 p Book 2617 contains illustrations and photographs of the latest sanitary engineering equipment and shows flow diagrams of how this equipment can be installed in typical waste treatment plants. — LINK-BELT CO., Dept. PR, Prudential Plaza, Chicago 1, Illinois.

W-14—Shop Equipment — Form 2451 describes and gives specification data on various types and models of Erectomatic shelving and steel shop furniture. Illustrated.—STANDARD PRESSED STEEL CO., Box 864, Jenkintown, Pa.

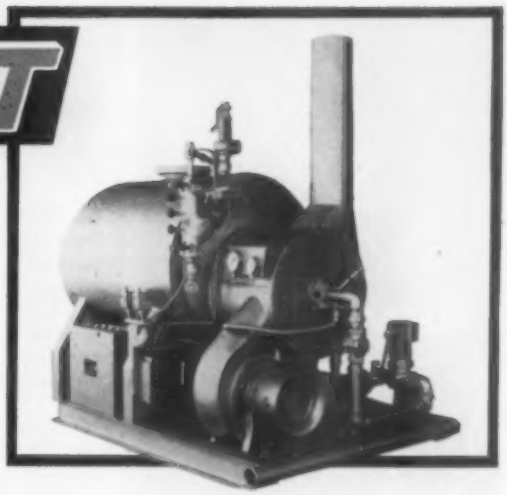
W-15—Transmission Machinery — 8 p Bulletin A-706 is a comprehensive review of company's line of power transmission machinery.—DODGE MFG. CORP., Mishawaka, Indiana.



dependable
accurate
lubrication
Put more sense in your lubrication dollars—with a Manzel Force Feed Lubricator. Outstanding Vacuum Pumping Units cut maintenance cost, increase accuracy, solve liquid sight feed problems. See your Manzel field engineer.
MANZEL
FREE CATALOG
gives complete
data on all Manzel
lubricators.
Manzel
318 Babcock Street
Buffalo 10, N. Y.
Specialists in metering pumps and lubricators since 1898

TXT

Vapormatic Coil-N-Shell Steam Generator gives you more horsepower . . . more steam generating capacity in much *less* space



The Vapormatic Coil-N-Shell requires only a fraction of the space used by conventional boilers of comparable horsepower and generating capacity. Its capacity is 5 to 150 psig steam outlet pressure with a power range from 35 to 300 HP.

A forced circulation, water tube type steam generator, the Coil-N-Shell is completely unitized with all components assembled as an integral unit on a common base. It generates steam from a cold start in ten minutes and is ready for high temperature immediately.

The Vapormatic Coil-N-Shell is completely automatic. All sizes have modulating controls as standard equipment. Available with gas, oil and combination gas-oil fuel burning systems.

Complete specifications and operating data for all sizes are contained in Bulletin 582 CSA. Write for your copy now.

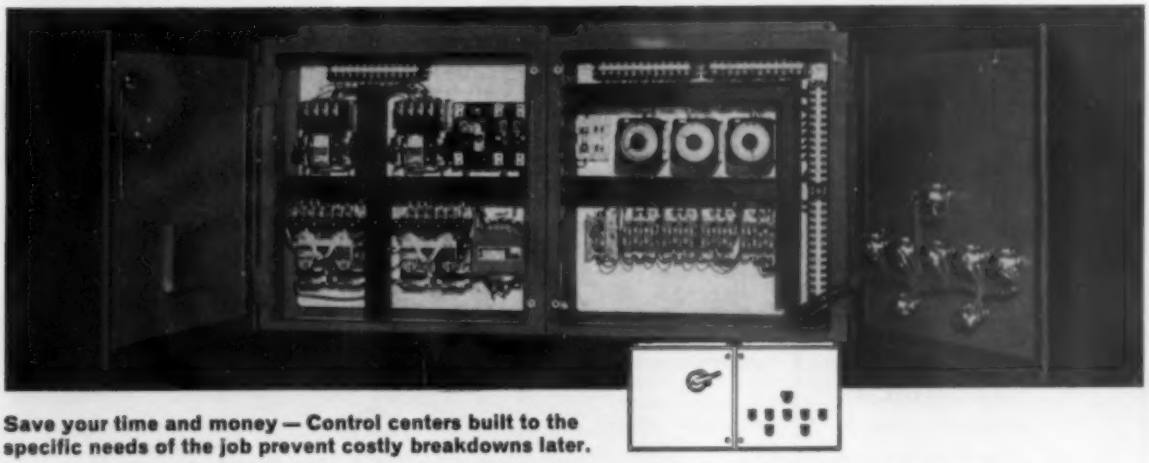
The Vapormatic Coil-N-Shell is quoted and shipped ready to fire up when feedwater, fuel, steam and electric lines are connected.

TXT TEXSTEAM Corporation

A SUBSIDIARY OF VAPOR HEATING CORPORATION

320 Hughes St. • P. O. Box 9127, Houston 11, Texas • Phone WA 6-8853

Custom-built from the best components...

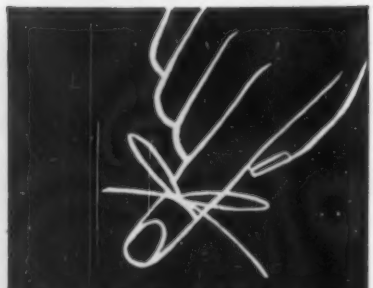


Save your time and money — Control centers built to the specific needs of the job prevent costly breakdowns later.

The Thomas B. Combs Co. has designed and built many control panels like the one above. Specializing in quick deliveries, we invite your problems and prints for complete estimates. Built from the best components available, Combs Panels are superior in every detail of construction. Write or phone for full information to:

THOMAS B. COMBS COMPANY
Custom Installations for 20 Years

1823 GORDON ROAD, S. W., ATLANTA 10, GEORGIA — PHONE PLAZA 8-5516



REMEMBER

PALMETTO Packings pack more performance into every application

GET THEM at any industrial distributor authorized to carry Palmetto Packings . . . For the name of a supply house near you consult our insert in Thomas Register—between pages 4816-4817.

GREENE, TWEED & CO.
North Wales • Pennsylvania

DEOXY-SOL
SOLUTION OF HYDRAZINE

Oxygen-
Scavenger
for
Boiler Water
Treatment

FAIRMOUNT
CHEMICAL CO., INC.
136 Liberty St., New York 6, N. Y.
Ask for pamphlet BW

New Product Briefs (Continued)

Spray Gun

J-28 The Guk-Rod, a tough, air-operated automatic spray gun, has been introduced by **Eclipse Air Brush Company,** 390 Park Ave., Newark 7, N. J. Designed for automatic production line use on sheet metal fabrication, it sprays automatically the very heavy viscous materials such as sound deadener, underbody coating, asphaltums, fibrated materials and adhesives.

The rugged Guk-Rod will work continuously for months even in a closed chamber, maintaining exceptional atomization and uniform dispersion, as well as withstanding high fluid pressures well over 500 psi.

The spray gun features hardened moving parts such as fluid tip and plunger, and a special design carbide nozzle insort. Fluid passages are clear and have large openings — the fluid hose connection is ¾" inside diameter. Moving parts are self-aligning; a special time-tested V-ring packing is used; and the air seal is protected by an extra wiping seal. For maximum results the Guk-Rod opens and closes by compressed air.

High Temperature Water Boiler

J-29 A new packaged high temperature water boiler has been developed by **Boiler Engineering & Supply Co., Inc.,** Phoenixville, Pennsylvania.

Called "Flo-Kontrold," the new boiler is specifically designed for high temperature hot water heating and process work. Water is circulated at temperatures between 250 F and 450 F with system loads from 4 to 100 million btu/hr.

Boiler and combustion efficiency is not only high but covers an unusual wide range of load requirements. The result is a very efficient high temperature water unit, with maintenance reduced to a minimum.

Circuits are arranged to eliminate the possibility of vapor locking as there are no reverse vertical down flow tube circuits. All circuits are drainable at one point through the bottom header and vented at one point through the top header.

Correct sizing of the orifice in the inlet end of each tube maintains the required velocity of water in each tube circuit. Each tube circuit has sufficient water due to metered flow to absorb the maximum amount of heat that will contact its surface.

The Flo-Kontrold Boiler is entirely supported on a structural steel frame and enclosed with a welded steel casing that is designed gas-tight for pressurized furnace firing. No special foundation or brick supporting construction is required.

With Flo-Kontrold, boiler circulating pumps are optional equipment as pressure drop through boiler is from 10 to 15 psi under normal operation and design conditions.

Systems make-up water is only a fraction of one per cent, so make-up water is handled with a minimum investment in auxiliary equipment. A water softener and a deaerating heater if used will need units with only 1/20th the capacity ordinarily required for the feed water treatment of a steam system of similar size using the same analysis of make-up water.

Classified Ads

ENGINEERS WHO CAN SELL

Attractive opportunity of employment for experienced sales engineers. Salary, expenses, and bonus arrangement plus profit sharing trust. Progressive company is 40 years old, well known. Products — air engineering equipment. To be preferred, applicants must have at least five years experience and college degree in mechanical or chemical engineering. Location in one of several large industrial centers. Write Box 257, Southern Power and Industry, 806 Peachtree St., N. E., Atlanta 8, Ga.

GENERAL

. . . a trusted name in coal

For many decades, General Coal and its Associated Companies have successfully met the varied needs of all types of coal consumers. You can rely on this experience for all your coal requirements.

WESTMORELAND COAL COMPANY

HAMPTON COAL

STONEGA COKE & COAL COMPANY

GLENBROOK · STONEGA · RODA · DENDRON · CROSSBROOK

JEDDO-HIGHLAND COAL COMPANY

Hazle Brook Premium Anthracite

GENCO ANTHRACITE & BITUMINOUS COALS

General Coal Company

123 SOUTH BROAD STREET, PHILADELPHIA 9, PA.

Branches:

Buffalo · Charlotte, N.C. · Cincinnati · Cleveland

New York · Norfolk

Your Choice for Convenience in PITTSBURGH

HOTEL PITTSBURGHER

Right in the heart of the Golden Triangle 400 outside rooms with TV and every comfort of modern hotel design. General Forbes Lounge and Dining Room . . . Air Conditioning. Airport Limousine and Taxi Service.

Forbes Avenue Below Grant

ATlantic 1-6970

JACKTOWN MOTOR HOTEL

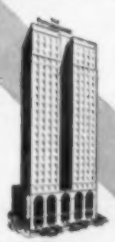
The very finest accommodations. 60 air-conditioned rooms with TV, telephone, combination tile baths. Excellent dining room. Facilities for group parties 15 to 500.

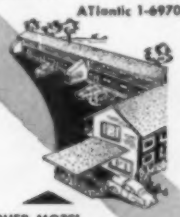
Route 30

Irwin, Pa.

1 mile West of Irwin Interchange

UNderhill 3-2100





KNOTT HOTELS

HOTEL PITTSBURGHER MOTEL

Opposite Greater Pittsburgh Airport on beautiful Airport Parkway West. 56 luxurious, air-conditioned rooms with tile bath, TV, private phone. Courtesy car to and from airport.

AMherst 4-5132

Joseph F. Duddy, Gen. Mgr.

★Teletype Service. For immediate confirmation of reservations at no charge . . . telephone any Knott Hotel—or teletype PG-29.

Route 30, Lincoln Highway, Shortest Route to Pittsburgh

---

in your hot water generator . . . look to FINNIGAN

Finnigan Hot Water Generators are engineered to give you large quantities of hot water for low operating cost. The finest materials, creative skill and quality construction assure efficient performance . . . "Fabricated by Finnigan" assures quality. Finnigan builds hot water generators to your specifications. Call, wire or write today for complete information with no obligation to you.

TANKS, SMOKESTACKS, PIPING, WATER HEATERS, BREECHING, PLATE WORK

J.J. FINNIGAN CO., INC.

722 Marietta St., N. W., Atlanta, Georgia

Houston 6, Texas, P. O. Box 6025
Dallas 9, Texas, 4431 Maple Avenue
Washington, D.C., 3714 14th St., N.W.
Kansas City 41, Mo., 1720 Harrison St.
Memphis, Tennessee, 5930 Laurie Lane
Jacksonville 4, Florida, P. O. Box 2527
Little Rock, Arkansas, 4100 C. Street
New Orleans 25, La., 4054 Thalia Ave.
New York 17, New York, 41 E. 42nd St.
S. Birmingham 5, Ala. 1107 Seventh Ave.

Index of Advertisers

This Advertisers' Index is published as a convenience, and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

A

Advertising Council ... *
Air Preheater Corp. ... 7
Allen-Bradley Co. ... 3
Allis-Chalmers Mfg. Co. ... 1
American Cancer Society ... *
American Engineering Co. ... 33
American Red Cross ... *
Ames Iron Works, Inc. ... 13
Anaconda Wire Cable Co. ... *
Anderson Chemical Co., Inc. ... 16
Anderson Co., V. D. ... *
April Showers—Southern ... *
Armco Drainage & Metal Prod., Inc. ... 71
Armstrong Machine Works ... *
Atlantic Steel Co. ... 11

B

Babbitt Steam Specialty Co. ... 86
Babcock & Wilcox (Boilers) ... *
Bailey Meter Co. ... 14
Belmont Packing & Rubber Co. ... 83
Bettcher Mfg. Corp., The, Panelbloc Div. ... 78
Bird-Archer Co. ... 65
Bituminous Coal Institute ... *
Blaw-Knox Company, Commercial Grating ... *
Blaw-Knox Co., Copes-Vulcan Div. ... 23
Boiler Engineering & Supply Co., Inc. ... 81
Boiler Tube Co. of America ... *
Boston Gear Works ... *
Brook Motor Corp. ... *
Brown-Boveri Corp. ... 2
Buell Engineering Co., Inc. ... 77
Business Publications Audit of Circulation, Inc. ... *
Bussmann Mfg. Co. ... *
Byers Co., A. M. ... *

C

Catawissa Valve & Fitting Co. ... *
Chapman Valve Mfg. Co. ... *
Charleston Rubber Co. ... *
Cherry Way Corp. (Hotel Pittsburgher) ... 99
Chesapeake & Ohio Railway Co. ... *
Childers Mfg. Co. ... *
Clarage Fan Co. ... *
Classified Ads ... 98
Cleaver-Brooks Co. ... 62
Cleveland Tramrail Div., Cleveland Crane & Engineering Co. ... *
Cochrane Corporation ... Fourth Cover
Combs Co., Thomas B. ... 97
Combustion Equipment Division, Todd Shipyards Corp. ... *
Continental Gin Co. ... 74
Copes-Vulcan Division, Blaw-Knox Co. ... 23
Crescent Belt Fastener Corp. ... *
Cyclotherm Division, National-U. S. Radiator Corp. ... 59

D

Dancer "Stikfile" Co. ... *
Dean Hill Pump Co. ... *
Detroit Stoker Co. ... *
Dixie Bearings, Inc. ... 9

E

Eastern Gas & Fuel Associates ... *
Eastern Stainless Steel Corp. ... *
Edward Valves, Inc. ... *
Elgin Softener Corp. ... *
Ellison Draft Gage Co., Inc. ... *
Emerson Electric Mfg. Co. ... 80
Equitable Equipment Co., Inc. ... *
Eutectic Welding Alloy Corp. ... *

F

Fairbanks Co., The ... *
Fairbanks, Morse & Co. ... *
Fairmount Chemical Co., Inc. ... 98
Finnigan, J. J. Co., Inc. ... 99
Fiske Bros. Refining Co., Lubriplate Div. ... *
Flexible Steel Lacing Co. ... *
Fly Ash Arrestor Corp. ... *
Foster Engineering Co. ... *
Foster Co., L. B. ... *
Foster Wheeler Corp. ... *
Frick Company ... 79

G

Gallien & Sons, R. P. ... *
Garlock Packing Co. ... *
Gates Engineering Co. ... *
General Coal Co. ... 99
General Electric Co. ... 17, 18, 19, 20, 21, 22
Goulds Pumps, Inc. ... *
Graver Tank & Mfg. Co., Inc. ... *
Green Fuel Economizer Co. ... *
Greene Tweed & Co. ... 98
Grinnell Co., Inc. ... Second Cover
Gulf Oil Corp. ... *

H

Hagan Chemicals Controls, Inc. ... 25
Hollaender Mfg. Co. ... *

I

Illinois Water Treatment Co. ... 88
Industrial Combustion, Inc. ... *
IPCO Laboratories, Inc. ... 61
Iron Fireman Mfg. Co. ... *

J

Jeffrey Mfg. Co. ... *
Jenkins Bros. ... Third Cover
Jordan Corporation ... *

K

Kalamazoo Tank & Silo Co. ... *
Kano Laboratories ... *
Kellogg Company, M. W. ... 4

L

Ladish Co. ... *
Leslie Co. ... *
Lewis & Co., Chas. S. ... 96
Liquidometer Corp. ... *
Lubriplate Division, Fiske Bros. Refining Co. ... *

M

Magnetrol, Inc. ... *
Manzel Division of Houdaille Industries, Inc. ... 96
Marley Co., Inc. ... *
Maryland Shipbuilding & Dry Dock Company ... *
Mason-Neilan Divisions, Worthington Corp. ... *
Massey Coal Co., Inc., A. T. ... 80
Mathews Conveyor Co. ... *
Midwest Piping Co., Inc. ... *

N

National Business Publications, Inc. ... *
National Supply Co., Tubular Products Div. ... 63
National Tube Co. ... 33
National-U. S. Radiator Corp., Cyclotherm Division ... 59
Niagara Blower Co. ... *
Norfolk and Western Railway Co. ... 57
Norgen Co., C. A. ... *
North American Mogul Products Co. ... *
North State Pyrophyllite Co., Inc. ... *

O

Otis Elevator Co. ... *

P

Pacific Pumps, Inc., A Division of Dresser Industries, Inc. ... 67
Panellit, Inc. ... *
Pantex Mfg. Corp. ... 82
Peerless Pump Divisions, Food Machinery Chemical Corp. ... *
Penberthy Mfg. Co. ... *
Pittsburgh Piping & Equipment Co. ... *
Plibrico Co. ... *
Porter, Inc., H. K. ... *
Powell Valves ... 29
Prat-Daniel Corp. ... *

R

Radiator Specialty Co. ... *
Reliance Gauge Column Co. ... 87
Reynolds Aluminum Supply Co. ... 70
Reynolds Metals Co. ... *
Riley Stoker Corp. ... 72, 73
Robvon Backing Ring Co. ... *
Roesch & Co., C. A. ... *

S

Sarco Co., Inc. ... 15
Southern Engineering Co. ... *
Southern Power & Industry ... *
Southern Water Conditioning ... *
Sprague Electric Co. ... *
Standard Oil Co. ... *
Sterling Electric Motors, Inc. ... *
Subox, Inc. ... *
Superior Combustion Industries, Inc. ... 8

T

Tennessee Corporation ... *
Texaco, Inc. ... *
Texsteam Corporation ... 97
Thomas Flexible Coupling Co. ... *
Todd Shipyards Corp., Combustion Equipment Division ... *

U

Union Steel Corporation ... *
United States Steel Co. ... 31
U. S. Hoffman Machinery Corp. ... *
U. S. Treasury ... *

V

Van Products Co. ... *
Vogt Machine Co., Henry ... *

W

Want Ads ... 98
Webster Engineering Co. ... *
Western Precipitation Corp. ... *
Westinghouse Electric Corp. ... 27
Wide-Lite Corporation ... 69
Williams Gauge Co., Inc., The ... 84
Wilson, Inc., Thomas C. ... *

Y

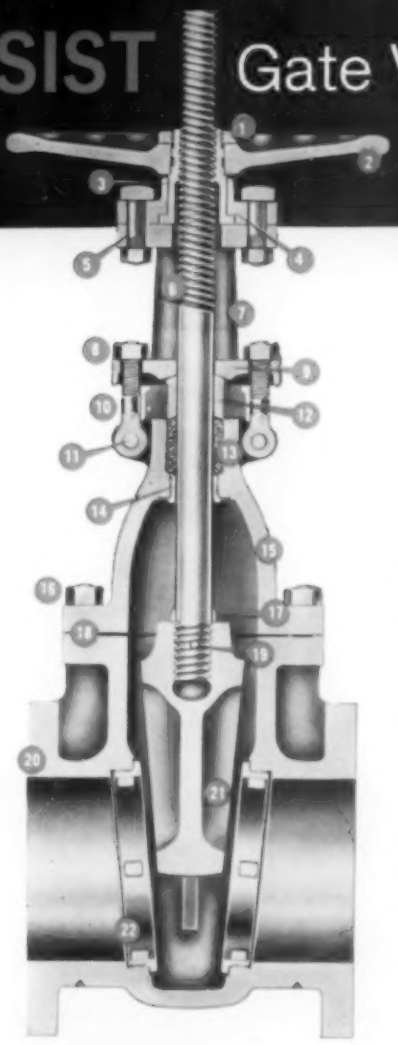
Yarnall-Waring Co. ... 55
Yuba Consolidated Industries, Inc., Heat Transfer Division ... *

Z

Ziegler & Co., G. S. ... *

You extend valve life in Corrosive and Erosive services TWO WAYS when you

Specify JENKINS for NI-RESIST Gate Valves, too



No. 1... when you specify "Jenkins" you get not merely "Ni-Resist" metal but you get Type 2 Ni-Resist Cast Iron! That affords extra resistance to acids, salt and alkaline solutions, sea water, brine and other corrosive and erosive fluids, vapors or gases. It is copper-free and will not contaminate or discolor the materials controlled.

Type 316 Stainless Steel is used for the wedge, spindle and other trimmings to give you a combination of metals which have remarkable ability to withstand destructive service.

No. 2... you get all the excellence which the Jenkins Diamond trademark has represented for nearly a century. The superior design and construction are visible here. Equally important superiorities which show up only in the records of long service and low maintenance are the close grain and high density of Jenkins castings ... the precision of Jenkins machining ... the rigid inspection and testing which every Diamond-marked valve undergoes.

It costs no more to buy Ni-Resist Gates made by Jenkins. And, it may cost much less to USE them. Write us, or ask your Jenkins Distributor for information folder No. 205.

1 Bronze yoke bushing nut
2 Handy grip iron wheel
3 Bronze yoke bushing
4 Iron yoke cap with zerk fitting for lubricating bushing
5 Steel yoke cap bolts and nuts
6 TYPE 316 STAINLESS STEEL spindle
7 NI-RESIST CAST IRON, TYPE 2, yoke
8 Bronze eye bolt nuts
9 Malleable iron gland flange
10 Steel gland eye bolts
11 Steel gland lug bolts and nuts
12 TYPE 316 STAINLESS STEEL gland
13 Teflon impregnated asbestos packing
14 TYPE 316 STAINLESS STEEL bonnet bushing
15 NI-RESIST CAST IRON, TYPE 2, bonnet
16 Steel bonnet bolts and nuts
17 TYPE 316 STAINLESS STEEL spindle ring
18 Asbestos gasket
19 TYPE 316 STAINLESS STEEL wedge pin
20 NI-RESIST CAST IRON, TYPE 2, through-port body
21 TYPE 316 STAINLESS STEEL solid I-beam wedge
22 TYPE 316 STAINLESS STEEL seat rings

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
JENKINS SINCE 1864 Jenkins Bros

Sold Through Leading Distributors Everywhere

JENKINS BROS., 100 Park Avenue, New York 17, N. Y.

Send folder No. 205 describing Ni-Resist Gate Valves

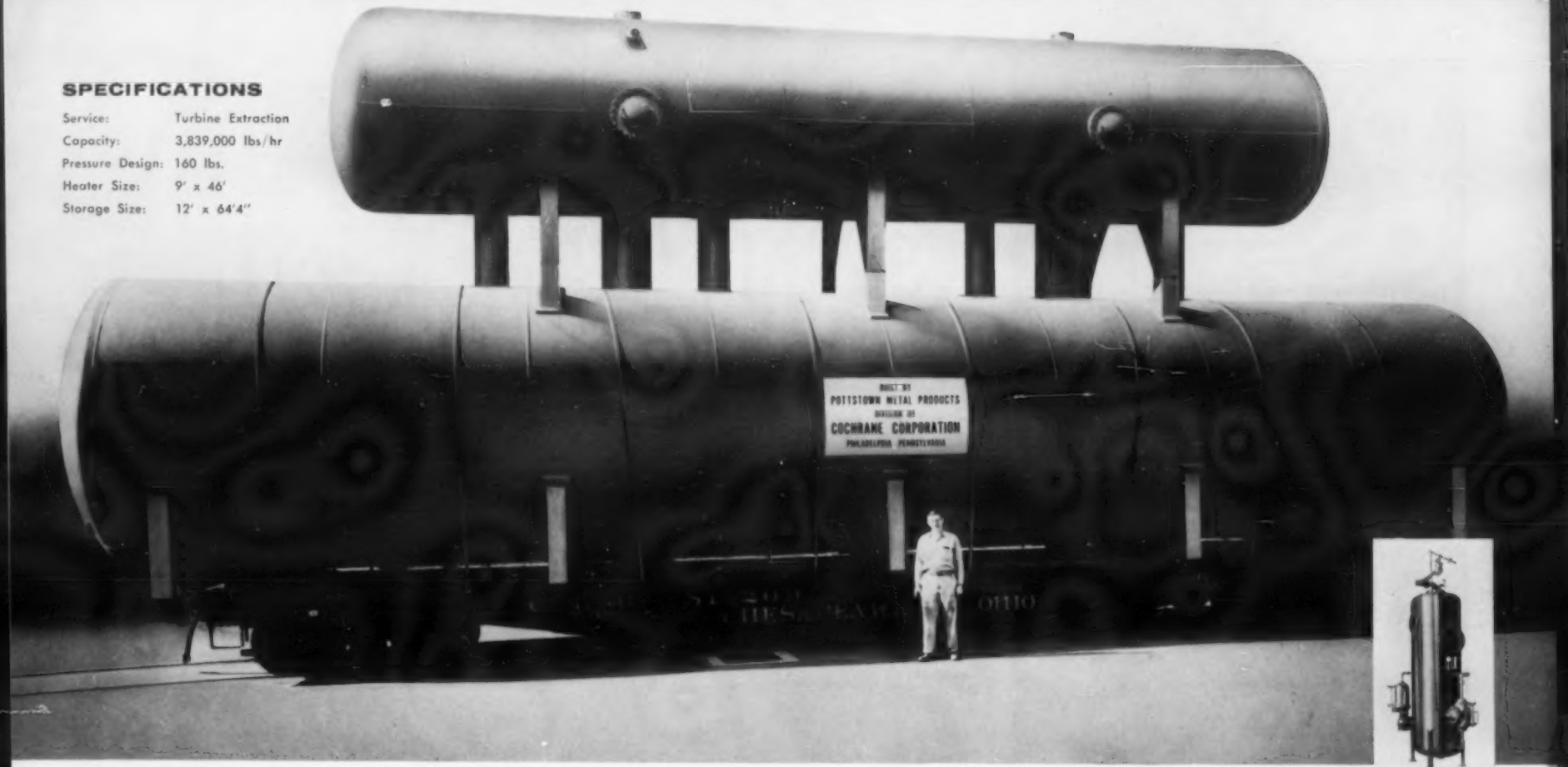
Name & Title .....

Company .....

Address .....

SPECIFICATIONS

Service:	Turbine Extraction
Capacity:	3,839,000 lbs/hr
Pressure Design:	160 lbs.
Heater Size:	9' x 46'
Storage Size:	12' x 64'4"



MIDGETS OR GIANTS

From the giant deaerator with its 12' x 64'4" storage tank above down to a 3' x 8' Unipac standard model, shown in comparable size in inset, there is no compromise in Cochrane's engineering and fabricating standards.

It took 96 years to build this Giant Deaerating Heater!

Ordered April 1958, delivered May 1959, the engineering background that made possible the design and fabrication of this gigantic unit has kept Cochrane foremost in its field for 96 years.

This 3,839,000 lbs/hr deaerator is designed for turbine extraction service in a public utility. An important contract requirement was an integrated tank shop capable of fabricating the shells to rigid specifications.

Cochrane pioneered in heater design and manufacture and today has the largest number of installations in the world. This background is your assurance that *guarantees will be met.*

Your requirements in deaerators, whether a small standard model or giant, can be solved readily by calling in a Cochrane engineer. Why not write today for the deaerator series bulletins . . . please specify the type in which you are interested.

Cochrane
CORPORATION
3110 N. 17th Street, Philadelphia 32, Pa.
Philadelphia • New York • Chicago
Cochrane Water Conditioning Ltd., Toronto 4, Montreal 1, Winnipeg 1, Canada
Representatives in 30 principal cities in U.S.; also Havana, Cuba; San Juan, Puerto Rico; Paris, France; La Spezia, Italy; Mexico City, Mexico; Caracas, Venezuela; Santiago, Chile; Honolulu, Hawaii.
POTTSTOWN METAL PRODUCTS DIV.—Custom built carbon steel and alloy products.
Demineralizers • Zeolite Softeners • Hot Process Softeners • Hot Lime Zeolite Softeners • Dealkalizers • Reactors • Deaerators • Pressure Filters
Continuous Blowoff Systems • Condensate Return Systems • Steam Specialties